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DEVELOPMENT OF INLAND WATERWAYS AND COASTAL SHIPPING

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INTRODUCTION

The present report has been prepared by the Transport, Communications and Tourism Division of the Economic Commission for Western Asia in accordance with Work Programme and priorities for the biennium 1982-1983. Programme element 551.4 b foresaw a report on the pontential for the development of inland waterway transport and coastal shipping.

The study was undertaken to provide certain guidelines for the establishment of an inland waterway transport system and of a coastal transportation system adequately responding to the requirements of modern transport in the region.

The report consists of two parts. Part I deals with inland waterways. It describes the networks of the two principal navigable rivers of western Asia, the Nile in Egypt and the Tigris in Iraq. It sums up the problem areas faced with the introduction of modern inland waterway transport. For support of decentralised economic and social development in the hinterland, along with the traditional small scale water transport, recommendations are made for short term and long term solutions.

Part II of the report deals with coastal and short sea transport in the region. It describes the existing pattern, identifies problem areas and recommendations are made for short term improvements and long term developments.

An interim report on the use of waterways and coastal shipping was prepared and distributed in 1982 to the authorities concerned in the ECWA member states (E/ECWA/TCT/82/2).

In preparing the present study, the data collected during missions, the replies to the questionnaire sent to the member states, together with available information from other sources, including various publications, have been used. However, a general lack of accessible accurate and consistent information on the subject, as recorded by both public authorities and private companies concerned, has no doubt limited the scope of the report. Besides unforturnately since 1980 the river transport on the Tigris has been disrupted and the pattern of sea transport in the Gulf has been disturbed due to hostilities in the area. This has evidently influenced the updating of information.

Anyhow, sufficient indications of the problem areas exist and have formed a base for the recommendations regarding short term improvements and long term development.

PART ONE

I INLAND WATERWAYS

1. Historical Background of the River Navigation in Western Asia

River navigation has been known and practised since early human history. Primary means of transport (floating) were practised. In the Nile Valley the Pharaohs used to wrap papyrus and leave it to float over the surface of the water to reach the destination where it was usually collected. In ancient Ninewah animal skins and stems of trees were made into a river vehicle known as "Al Kalak" and was left to float over the surface of water for the transport of people and cargo.

Development took place in all means of transport. Various kinds of lighters and boats, capable of making use of the water and winds currents were introduced. These were followed by steam ships and motor vessels for better economical use of the waterways as well as for other purposes.

In the ECWA region the Nile, Tigris and Euphrates have been used for the transport of people and goods all over the life history.

1.1 EGYPT

1.1.1 Introduction

The Nile which has been called "the father of African rivers", is the longest river in the World. It originates south of

the equator from where it flows northward over some 6,648 kms through northeastern Africa to drain through the Nile delta into the Mediterranean.

The Nile river basin which covers about one-tenth of the area of the Continent has brought prosperity to its inhabitants and it has served as the stage for the evolution of civilizations in the ancient world.

Intensive land cultivation along its river banks for agricultural production has been made possible by the availability of water from the Nile throughout the year, ideally combined with high temperatures.

The Nile swells during the summer as a result of heavy tropical rains around the Upper Nile Basin, both in Ethiopia and on the East African Plateau. Water level starts to rise and continues to do so throughout the summer with the maximum occuring in the Sudan during September and in Egypt during the month of October. The level of the river then falls rapidly through November and December. From March to May the flow of the river is at its lowest.

For the purpose of a better use of the Nile water for irrigation, it was decided in the 19th Century to construct a series of diversion dams across the Nile, starting at the head of the Delta, about 12 miles north of Cairo. The dams would raise the level of water upstream to supply the irrigation canals and to regulate navigation. The Delta Barrage scheme started in 1843, was completed in 1861, and later it was extended and improved.

In the same context, and in 1902, the Asyut Dam, more than 320 Kilometers upstream from Cairo, was built. This was followed in 1909 by the construction of the barrage at Isna, about 360 km above Asyut, and in 1930 by constructing the dam at Nag' Hammadi, some 190 km above Asyut.

The first Aswan dam was constructed in 1902. The dam has been strengthened and the height increased more than once, and finally the new Aswan High Dam was built. Following the construction of the Aswan High Dam in 1971, which created Lake Nasser, the entire water supply has been regulated from Aswan down to Cairo. The High Dam is located about 960 km upstreams from Cairo. The dam was designed to control the Nile water mainly for the expansion of irrigation, for the generation of hydroelectric power and to provide protection against high floods.

1.1.2 Navigational Aspects of the Nile and its Delta Canals

The history of inland navigation in Egypt is probably as old as the history of the country. Since the early settlements at the river banks it provided a natural means of communication among the settlements and of transporting agricultural products to the cities.

In the old days there was little conflict between the irrigation requirements and trasnport interests mainly because of the small size of the traditional sailing boats dominating the transport pattern. And therefore the regulation of water supply has by tradition been in the interest of irrigating agricultural land.

It is only recently that transport has developed along lines of industrial approach, taking into account economy of scale, following similar developments in agricultural and industrial production and the patterns of river transport developments elsewere in the world.

Modern water transport development has now put its own requirements on the river infrastructure and water availability, in order to ensure an optimum utilisation of its transport characteristics for the benefit of the economic development in the hinterland. In this respect, it will be necessary to include to a greater extent the needs of shipping in the process of regulating water supply, and to adjust, where applicable, the river infrastructure to the possible watersupply in the proposals for river improvements for accommodating efficient modern water transport.

The existing network for inland navigation consists of the river Nile and its system of irrigation canals, See maps 4.1 and 4.2. The network includes the following waterways:

- The Nile River from Aswan to the Delta Barrage. (approximately 960 km).
- Beheiriya, Nubariya canals.
- El Khandak, El Sharki, El Mahmoudiya canals.
- El Bagouria canal up to the Rosetta Branch.
- Menufi, Tanta canals.
- Bahr Shebin canal upto some kilometers beyound Mahalla El Kubra.
- El Abasi canal, connecting Bahr Shebin canal and Tawfiki.

- Mansuriya canal.
- Tawfiki/Mansouriya canal.
- Bahr El Saghayer canal upto a few kilometers beyound Dekerues.
- Ismailia canal.

From the transport point of view the river Nile from Aswan to the Delta Barrage, and the Beheiriya/Nabariya canal link between the Barrage and the port of Alexandria have presently been the most important axis. The rest of the network is only occasionally used for transporting relatively small quantities of goods, mainly construction materials, and is only accessible for small motorized vessels, and sailing boats. Henceforth the underlying report has been concentrating on the Nile and the Beheira/Nabariya canal.

1.1.2 a) The River Nile from Awan to the Delta Barrage

Looking at the river from the point of view of navigability, it appears that the Nile, downwards from Aswan to the Delta Barrage has two distinguished main sections. The first one is reaching from the High Aswan Dam downstream to some 15 km beyound Asyut, covering some 600 km. The available water depth along this stretch is generally sufficient to allow the present Nile barges being fully loaden till a draught of 1.80 m to travel without difficulties during most of the year.

There are three locks located along this stretch with the same dimensions. The locks of Asyut and Isna allow the passage of fully loaded barges with draughts upto 1.80 m during the whole year. However there appears to be a considerable build-up of silt at the

Nag' Hammadi lock. During the low water period limiting the maximum draught of the barges to only 0.70 - 1.40 m reducing considerably the load factor of the barges. It appears therefore that this is a real bottleneck for water transport on this section of the Nile. Consequences are quite serious, at this effects the reliability of water transport and at the same time increases the costs of operations and the tariffs. In case road and /or rail transport has to balance the loss of water transport capacity, the final cost of transport will be reflected in the economics of production. A relief of the situation could be achieved by programming dredging at certain periods of the year where possible combined with some hydraulic construction for minimizing the building up of silt.

The three locks have widths of 16 m but are only 80 m long. This causes barge units, (around 100 m) to be separated before entering the locks, and to be united after leaving.

The second river section reaches from Asyut till the entrance to the Beheiriya Canal at the Delta Barrage. This stretch without any locks is some 390 km long. The main problems for navigation on this river section are shallow patches, reducing the maximum draft of the vessels, allowed during the low-water periods, to 1.30 m. Such a reduction in draft does reduce the trasnprot capacity of the fleet drastically, particularly the bigger units which are mostly the modern ones.

The aforesaid difficulties affect the reliability of the water transport in the sense of availability and capacity throughout the year. It also affects the operating costs of the fleet per volume

unit transported. It decreases the competitiveness of water transport, and it increases the price of mostly low cost commodities, affecting the cost of living of the low income classes and the costs of industrial products based on these commodities.

As water transport is the cheapest form of long distance transport, and cannot be replaced as such, there is a strong economic incentive in optimizing the waterway capacity, tuning to each other the costs of infrastructure and the expected gains of efficient inland water transport.

There is a lack of information quantifying the effects of the shoals on the transport capacity and costs, in relation to the actual and potential demand for water transport. It is therefore recommended that a coordinated review be made on the technical solution and operational requirements which will provide a sufficiently deep riverbed throughout the year, and an optimum size and type of vessels most suitable to the actual and potential requirements of a reliable and efficient water transport, system.

1.1.2 b) Beheiriya-Nubariya Canal

The Beheiriya - Nubariya Canal links the river Nile at the Delta Barrage with Egypt's major seaport of Alexandria (See map 1). As such it is the most important inland transport canal. Shipping on this canal is confronted with some structural problems which form constraints for the efficient operations of inland water transport.

The draft of vessels in the canal is limited to 1.40 m during the three month period October to December and to 1.50 m during the rest of the year. The Beheiriya canal is crossed at four places by swing-bridges and it has four locks. There are some sharp curves in the canal which are causing navigational problems to large units.

The Nubariya Canal, which has four locks, in its last section near the Port of Alexandria narrows down to only 25 m width and there are also some sharp curves. These circumstances cause problems for safe navigation and the development of efficiency in water transport. Apart from this there has been the problem of maintaining appropriate protection of the banks of the canal.

The inland waterway link between the seaport of Alexandria and the river Nile is of major importance. It is therefore recommended that an appraisal be made of the technical measures required to upgrade the existing canal to the same level of quality and capacity as provided by the river Nile in a phased programme.

Table 1 provides information on the maximum drafts for vessels on the various navigable waterways.

Because of the fluctuating water releases at the High Aswan Dam, the water depths do vary during the year. A vessel draught of 1.80 m on the river Nile is possible during a number of months (June - August). However the capacity of vessles with a design draft of 1.80 m cannot be optimally used during other months. There are two ways open to improve the utilisation of the vessel capacity throughout the year. First there is the possibility to improve the profile of the river bed by hydraulic engineering works and additional maintenance dredging

operations. Second the possibility of negotiating an adjustment of the water release programme in the interest of maintaining an adequate water depth for navigational purpose on the river as long as possible. This requires an institutional arrangement between the authorities representing the interests of irrigation and of water transport to apply improved schemes for water releases. Furthermore it might also be useful for users of the waterways to have an information service announcing daily the actual waterlevels and the forecasts. This would allow the shippers to plan the load factor of their vessels in a most effective way.

Table 1 : Permissible Draught on Navigable Inland Waterways

Stretch	Period	Draught in meters
The Nile from the Aswan Dam to the Delta Barrage	September - March	1.3
	April - May	1.5
	June - August	1.8
Delta Network		
Beheiriya Canal	January - September	1.5
El Nubariya Canal	October - December	1.4
El Khandak Canal	January - December	1.4
El Sharki Canal		1.4
Bagouria Canal		1.5
Bahr Shebin Canal		1.5
Mahmudiya Canal		1.4
Menufi Canal		2.0
Tanta Canal		2.0
Mansouriya Canal	January - December	1.5
Bahr El Saghayer Canal		1.5
Ismailia Canal	January - May	1.4
Tawfiki Canal	January - December	1.5

Source : Compiled by ECWA/TCTD on the basis of national sources.

1.1.3 Maintenance of the River Network

Certain efforts are being made by the General Authority for River transport to maintain and improve river navigation on the main river stretch Aswan-Cairo-Alexandria and other waterways. One of the instruments to be used is dredging. However dredging is not carried out as part of a systematic programme. It is mostly done upon complaint of the waterway users. This might be due to under capacity of available dredging equipment and or qualified dredge masters and crews. It is therefore recommended that an appraisal be made of the dredging requirements in quantity and quality together with a review on the existing dredging fleet, its suitability and performances as well as the adequacy of the manning scales. The review has to include recommendations for any additional fleet capacity, maintenance schemes as well as efficiency in operations and training of personnel.

According to the General Authority for River Transport, the volumes of dredging and the costs involved are given in Table 2.

1.1.4 River Transportation

The information collected on river transportation reveals a general lack of accessible statistical data for development purposes. It was not possible to establish reliable time series of volumes transported and or ton-km performed on the inland waterway network. Some statistics on traffic flows were provided by the publicly owned shipping companies involved in inland water transport. These are: the Nile Company for River Transport, the Nile Company for Water Transport and the Sugar Company.

Table 3 gives the volumes of cargo transported and the ton-km performed by these three companies.

Table 2 : Volume of dredging and cost involved

year	dredging volume (000) c.m.	dredging cost (000) £. E.	cost per c.m. in £.E.
1970	75	13,8	0.184
1971	331	117,8	0.556
1972	25	16,2	0.650
1973	110	34	0.309
1974	144	44,3	0.308
1975	n.a.	n.a.	n.a.
1976	16	3,1	0.193
1977	210	64,9	0.309
1978	382	94,0	0.246
1979	187	150,0	0,802
1980	393	421,0	1.070
1981	718	490,0	0.680

Source : General Authority for River Transport

n.a. = not available
c.m. = cubic meters
£. E. = Egyptian pounds

Table 3: Volume of cargo transported and ton-kilometers performed by the publicly owned fleet

Year	Nile Co. for River Transport		Nile Co. for Water Transport		Sugar Company		Total	
	(000) tons	mil t/km	(000) tons	mil.t/km	(000) tons	mil.t/km	(000) tons	mil. t/km
1970/71	1357	1074	984	836	2341	1910	4682	3820
1971/72	1248	1134	1272	1152	2520	2286	5040	4570
1973	1045	998	738	702	1783	1700	3566	3400
1974	1119	886	743	696	1862	1582	3724	3164
1975	1444	1103	1121	992	2565	2094	5130	4189
1976	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	-
1977	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	-
1978	1433	627	1461	570	n.a.	n.a.	-	-
1979	n.a.	549	n.a.	532	646	374	-	1455

Source : Compiled by ECWA/TCTD on the basis of available data

n.a. = not available.

The volumes of cargo transported and the ton-kilometers performed do fluctuate, they do show little or no basic growth.

The inland waterway transportation sector is composed of two major publicly owned river fleets, the fleet of the Sugar Company and a privately owned fleet. Besides these there is the large fleet of small sailing boats which traditionally participates in river transportation, but because of the small size of the vessels its share in the total volume transported is falling behind.(see Table 4).

Table 4: The transport output by the three main groups for 1979

	Cargo transported		t/km performed	
	(000) tons	%	mil.	%
The two publicly owned river companies:	2600	72.8	957.7	65.0
The Sugar Company	646	18.1	373,7	25.3
Privately owned fleet:	324	9.1	143,6	9.7
Total	3570	100	1475	100

Source : Compiled by ECWA/TCTD on the basis of available data

As can be seen from the table the fleet of the two publicly owned companies carried more than 70% of the total river traffic in terms of tonnes and some 65% in terms of ton/kilometers.

1.1.5 Trade Flows

The Volume of freight traffic outside Aswan - Cairo - Alexandria corridor is limited. Cairo-area is the main loading and unloading point of the corridor. Approximately 87% of the cargo transported from Alexandria and the Delta area is unloaded at Cairo, and approximately the same amount of cargo is loaded for Upper Egypt destinations.

As far as downstream traffic is concerned, Qena, Minya and Aswan governorates are the main points for loading cargo. The bulk of this cargo is unloaded at Cairo-area. Smaller quantities of this cargo go between Cairo and Alexandria.

There are three points which do give relevant information on the traffic in the corridor. These points are at the locks at Asyut, in the Beheiriya Canal and at the end of the Nubariya Canal (Alexandria Seaport). The traffic through these locks in 1980 and in 1981 is given in Table 5.

It has to be noted that cargo transportation in the Nubariya and Beheiriya canals is not well balanced. It appears that only a mere 5% of the total traffic goes north bound. An analysis of commodity movements and an investigation into the possibility to promote northbound water traffic, utilizing the over capacity, would be worthwhile.

Table 5 : Traffic through locks in the Aswan, Cairo, Alexandria Corridor

Location	traffic through locks			
	1980		1981	
	number of vessels	cargo in (000)tons	number of vessels	cargo in (000)tons
1. Asyut (The Nile River)	10978	1646	12399	2078
2. Beheiriya Canal	9979	1082	9403	1381
3. End of Nubariya Canal	5903	1033	7869	1242

Source : Government authority.

Traffic on the Nile is more balanced on the section between Cairo and Minya, but more upstreams traffic is becoming less balanced as well and mostly at the expence of the Aswan-area. Outgoing cargo prevails there over incoming and a similar analysis of commodity flows and an investigation of the possibility to promote utilization of fleet capacity is recommended as well.

1.1.6 Type of Commodities Transported

A picture of the main commodities being carried on the river network in 1979 is given in Table 6.

Cargo was transported over an average distance of 410 km in 1979. A short description on the transport of some main commodities is given.

Table 6: Commodities transported on the inland waterway network

Commodity	volume (000)tons	%	t/km (mil)	%	average distance of sailing (km)
Petroleum Products	913	25	344	23	377
Cement	180	5	101	7	561
Phosphate	243	7	120	8	494
Coal	705	20	185	13	262
Minerals	792	22	288	20	364
Sugar	108	3	74	5	685
Molasses	275	8	177	12	644
Others	354	10	177	12	500
Total	3570	100	1466	100	410

Source : Compiled by ECWA/TCTD on the basis of available data.

Petroleum Products in small quantities are transported from Suez and Cairo refineries to Upper Egypt. The bulk of petroleum products is shipped from Cairo by barges to neighbouring governorates.

Coal is imported via Alexandria and transported by the vessels of the publicly owned Nile companies to Helwan.

Construction materials (bricks, and gravel) are mostly transported over short distances, by sailing boats.

Minerals and limestones are transported over various distances. The main flow of limestone is that from Minya to Cairo.

Aswan is the main deposit area of kaoline in the country. The main destinations of which are Alexandria and Cairo.

Sulfur and Pyrits are both imported via Alexandria. The main unloading points are in Beheiriya, Cairo and Asyut.

Raw Sugar and Molasses are carried by the Sugar Co. vessels. Raw Sugar is shipped from factories in Aswan, Qena and Sohad to Hawamdia (near Cairo). Molasses is transported in special tankers from Upper Egypt to Hawamdia and to Alexandria.

Other Commodities, include: fertilizers transported from Aswan-area to various governorates, manufactured goods imported via Alexandria and carried to Cairo and further to Upper Egypt,

1.1.7 River transport operators and their fleet

An overview of the motorized fleet operating on the Nile and its ownership is given in Table 7.

1.1.8 Public Fleet

There are three major companies operating on the Nile. These are the General Nile Company for River Transport (NCRT), the General Nile Company for Water Transport (NCWT) and the Sugar Company. Together they represent some 88% of the total fleet, not including the sailing boats, and some 90% of the loading capacity. The Sugar Company, is also publicly owned, and belongs to the Ministry of Industry.

Table 7 : River transport operators and the capacity of their fleet

	number of craft	%	loading capacity (000) tons at max draught	%	average tonnage	at 1.50m draught	%	average tonnage
Both Nile Companies	723	70.0	240,0	72.7	332	194,0	72.2	268
Sugar Company	189	18.3	60,0	18.2	317	47,4	17.7	251
Private sector	121	11.7	30,2	9.1	250	27.1	10.1	224
Total	1033	100	330,2	100		268,5	100	

Source : Compiled by ECWA/TCTD on the basis of available data.

The NCRT and the NCWT own 490 powered craft and a fleet of 300 dumb barges. Nearly two thirds of the twinship fleet consists of a combination type of craft, which can carry liquid as well as dry cargo.

The total loading capacity of their fleet is approximately 240,000 tons. But draught restrictions during long periods of the year do prevent part of the fleet to be loaded up to full draught of 1,8m. When loaded to a restricted draught of 1,50m, the total loading capacity is estimated to be reduced to some 194.000 tons, representing an average reduction of some 20%. It needs however to be stressed that the capacity of the more modern vessels is reduced with 29% and 26% to 71% and 74% of their full draught capacity respectively.(see table 8).

Table 8: The composition of the fleets of the NCRT and the NCWT (1979)

type of craft	number of units	total h.p. (000)	average h.p.	total capacity (000) tons at max draught	total capacity (000) tons at 1,50 draught	%
Self-Propelled craft:						
Twin ships						
for dry cargo	50	20,0	400	14,6	13,1	90%
for liquid cargo	4	1,9	475	1,4	1,0	71%
Combination	160	74,3	465	57,7	42,7	74%
Sub total	214	96,2		73,7	56,8	
Barges	152	22,5	148	42,3	36,2	86%
Tankers	65	9,8	150	17,7	15,2	86%
Sub total	215	32,3		60,0	51,4	
Dumb craft:						
Barges	51			11,4	10,2	89%
Tankers	35			6,4	5,8	91%
Sub total	86			17,8	16,0	
Total	515	128,5		151,5	142,2	

The commonly used twinship is at present the biggest combination operated in the river fleet in Egypt. When fully loaded it has a capacity upto 800 tons (see table 1)

The fleet of the Sugar company consisted of 181 cargo vessels with a total capacity of nearly 60,000 tons. The fleet also includes 112 tankers. The Sugar Company vessels carry raw materials, intermediate products and supplies to and from various factories which are mainly located in Upper Egypt along the Nile River. Table 9 is giving the composition of the fleet of the Sugar Company in 1980.

An important part of the fleet consists of special purpose tankers for the transport of molasses. The tug and dumb barge system is used for the transport of other (general) cargos.

Table 9: Number,type and capacity of craft of the Sugar Company (1980)

type of craft	number of units	total h.p. (000)	average h.p.	capacity (000) tons		
				at max draught	average capacity tons	at 1,50 draught
Self-propelled barges	12	1,6	133	3,2	267	3,1
Self-propelled tankers	43	7,8	181	16,0	372	12,9
Self-propelled molasses tankers	69	11,8	171	28,2	409	20,0
Self-propelled combination barges	9	1,3	144	2,6	289	2,2
Dumb barges	48	-	9,6	9,6	200	9,6
Total	181	26,8		59,7		47,8

Source : Compiled by ECWA/TCTD on the basis of national sources.

1.1.9 Private Sector Fleet

The number of privately owned craft in 1979 was 121 and its combined loading capacity around 30.2 thousand tons, when fully loaded and nearly 27.0 thousand tons at 1.50 m draught (see table 10).

Table 10: Privately owned fleet

tonnage	number of craft	total capacity (tons)		average load per craft	
		at max draught	at 1,50m draught	at max draught	at 1,50m draught
Up to 50	3	75	75	25	25
51 - 100	9	675	675	75	75
101 - 150	6	750	750	125	125
151 - 200	15	2625	2625	175	175
201 - 250	21	4725	4725	225	225
251 - 300	30	8250	7500	275	250
301 - 350	26	8450	7150	325	275
351 - 400	2	750	600	375	300
401 - 450	8	3400	2600	425	350
451 - 500	1	475	400	475	400
Total	121	30175	27000		

Source : Government authority

1.1.10 Sailing vessels

Sailing vessels in general operate in governorates where the owner lives. Information on the sailing vessels registered by the governorates is given in Table 11. They are classified as wooden and as steel vessels.

Table 11 : Number and capacity of sailing boats (1979)

Governorate	wooden			steel		
	number	capacity (000) tons	average tonnage	number	capacity (000) tons	average tonnage
Beni Suef	59	0,7	12	83	4,9	59
Minya	502	6,1	12	290	15,9	55
Asyut	10	0,1	-	125	7,1	57
Qena	103	1,6	15,5	210	13,9	66
Gharbia	99	1,4	14	166	13,0	78
Beheira	-	-		87	3,7	42
Minufiya	6	0,3	-	29	2,5	86
Damiettr	344	5,6	16,3	87	3,7	42
Ismailiya	-	-	-	6	0,6	100
Total	1123	15,8		1083	65,5	

Source : Government authority

The number of both wooden and steel sailing boats in 1979 was 2206 with a total capacity of 81,300 tons.

1.1.11 Fleet Characteristics

Data on fleet characteristics could only be provided by the NCRT, the NCWT and the Sugar Company. Most of the river craft of their fleet were built abroad. The bigger units which carry the bulk of the cargo, have a design draught of 1.80 m. Such a draught of 1.80 m is at present available in the Nile and canals only during a limited period of some three months per year. The fleet capacity can not be fully utilised during the rest of the year. Attention should be given to the possibilities of increasing the water depth upto 1.80 m over the entire Aswan - Cairo - Alexandria corridor throughout the year. Attention has also to be given to those locks in the waterway network where capacity does not correspond to the requirements of modern navigation and fleet operation.

The operational efficiency of the fleet of the NCRT is rather low since the fleet appears to be out of service for an average period of four months per year for repairs and because of absence of cargo.

German Nasser Units, the most productive part of the fleet, were out of service for an average of 74 days, while the other types of craft are out of service during some 6 months of the year.

The actual use of capacity for the public companies' fleet is estimated to be in the order of 30%, either because of draught restrictions during several months of the year or unbalanced load factor on the main routes.

Table 12: Some particulars of the Nile River Company fleet

type of craft	number	average h.p.	average capacity (tons) at max draught	per unit	at 1,50m draught	per unit
German Nasser						
- pusher	32	460	380	800	270	610
- dumb	36		420		340	
El Nada						
- pusher	25	330	306	746	275	575
- dumb	25		340		300	
El Nahri						
- pusher	36	460	350	764	250	565
- dumb	31		414		315	
Hungarian Naser						
- pusher	28	460	352	784	260	590
- dumb	28		432		330	
Self propelled barges	58	165	281		250	
Self propelled tankers	36	165	279		250	
Dumb barges	32		228		228	
Dumb tankers-barges	29		187		187	
Tugs	39	194				

Source : Government authority.

1.1.12 Age of the fleet

Accessable information on the age of the fleet was only available for the two publicly owned companies. Many private operators are not aware of the age of their craft often as the result of many changes in ownership.

Table 13: Age of the fleet of the NCWT and the NCRT

age in years	NCWT				NCRT				TOTAL		
	number of ships	capacity (000) tons	%	average tonnage	number	capacity (000) tons	%	average tonnage	number	capacity (000) tons	%
Up to 10	43	18	17	418	72	28	21	389	115	46	19
11 - 20	153	54	50	353	179	68	51	380	332	122	50
21 - 30	58	17	16	293	73	16	12	219	131	33	14
31 - 40	55	13	12	236	33	6	4	182	88	19	8
Over 40	40	5	5	125	78	16	12	205	118	21	9
Total	349	107	100		435	134	100		784	241	100

Source : Government authority.

It appears that 57% of the combined fleet, representing 70% of its capacity, consists of vessels where age does not exceed twenty years. About 30% of the total tonnage is close to or has already exceeded the economic lifetime of the vessels which has been assumed to be about 25 years.

1.1.13 Riverports

There are more than forty riverports and landing places situated along the Nile River and canals. Most of these ports serve only one main commodity, only a few ports serve a range of different commodities. From this point of view the ports can be divided into three main groups:

- specialized or industrial ports.
- ports of local interest
- principal ports.

A destination can be made between public and private ports. The public ports are in principle open for all ships, all cargo and all inland transport operators. The use of private ports may often be restricted to one (private and/or public) company which often also operates the port.

A technical change has taken place for the river ports since the construction of the Aswan High Dam in 1971. The regulation of the water discharge has caused the average water level in the Nile to fluctuate much less than before. For the ports built before the Dam, their quay-decks became higher than necessary for the present high water levels, a disadvantage for efficient cargo handling operations. The infrastructures of many ports are rather poor and often impose that cargo be loaded and unloaded outside the ports. A summary of river ports infrastructure and performance are given in table 14.

Table 14: River ports infrastructure and performance (1979)

port	group	ownership	cargo handled (000) tonns	type of cargo handled	port equipment and facilities
1	2	3	4	5	6
Aswan	P	Private	100	Cement, Kaolin	1 crane
Kima	S	"	60	Fertilizer	1 crane, 2 conveyors
River Transport Co.	S	"	100	Clay	1 crane 2 belt loaders
El Kebira	S	Public	45	Limestone	----
Kom Ombo	S	"	200	Sugar cane, molasses	1 crane
IDFU Sugar Factory	S	Private	n.a.	Sugar cane	1 quay 1 crane 1 conveyor
Sibaiya Phosphate mining Co.	S	Public	154	Rock	2 berths 2 conveyors
Armant Sugar Factory	S	"	110	Sugar cane, Sugar	2 piers 100m of protected river bank 2 cranes
QUS Sugar Factory	S	Private	110	Sugar cane, Sugar	2 berths 2 cranes
Qena Public	S	Public	n.a.	n.a.	3 piers
Qena Oil	S	Private	87	Petroleum products	storage tank, pumps
Dishna Sugar Factory	S	Private	n.a.	Molasses	2 pipes 2 cranes
Nag Hammadi Aluminium Co.	S	"	15	Aluminium, Oil	3 berths 3 cranes 3 pipelines
Nag Hammadi Sugar Factory	S	"	n.a.	Sugar, Oil products	1 crane 1 loading belt

Continued

1	2	3	4	5	6
Sohag River Co. Port	S	Private	n.a.	Oil	1 pier 2 pumps 1 Pipeline
Sohag Public Port	L	Public	45	n.a.	none
Asyut River Co.	S	Private	n.a.	Oil	Storage tank 2 pumps
Asyut Power Station	S	"	10	Oil, Cement	1 pier 1 pump 1 crane
Asyut Public, (Landing place)	S	Public	30	Cement	None
Minya River Co.	S	"	225	Oil, Oil products	2 pumps 1 pipeline
Minya Public	S	"	n.a.	Cement, Limestone	none
Samalut (Helwan Steel Co.)	S	Private	n.a.	Limestone	n.a.
Samalut Public	L	Public	200	n.a.	none
Beni Suef	L	"	15	n.a.	none
El Tabbin	S	Private	800	Oil products	2 jetties pipelines pumps
Helwan Steel Co.	S	"	1000	Coal, Limestone Scrap	10 Berths 8 cranes
Helwan Cement Co,	S	"	85	Limestone	4 berths

Continued

1	2	3	4	5	6
Ather El Nabi	P	Public	n.a.	Limestone fluit, vegetables Sand, Construction material	1 quay of 450 m
Ceramic Factory	S	"	100	Kaolin	n.a.
Hawandiya	P	Private	700	Molasses, sugar Oil products, General cargo	5 berths conveyors pipes, cranes
Imbaba	S	"	170	Grain	2 berths
Shubra	S	Public	n.a.	Phosphate Fertilizers	none
Bolin	S	Private	200	Phosphate, Pyrites, sulpher	none
Nozma	S	"	35	Clay	none
Mitras	S	"	15	Aluminium products	1 crane
Alexandria	P	"	n.a.	Coal, food grain sulphur, molasses	2 conveyors

Source : compiles by ECWA/TCTD on the basis of available data

S = specialized ports

P = principal ports

L = ports of local interest

n.a. = not available

Twenty five ports, out of thirty six appeared to have handled 4,611,000 tons of cargo in 1979 and are no more than landing places.

The private ports, mostly developed by industrial companies, handle one or two types of cargo, mainly sugar or minerals. The facilities are in general restricted to the handling of such commodities. Some of the ports have no facilities and equipment at all and manual cargo handling is prevailing at these places. No performance indicators on cargo handling production in the ports were provided.

1.1.14 Port Facilities and Equipment

Aswan Port handled around 100,000 tons of cargo (1978). The main commodities are kaolin and cement. The port equipment consisted of one mobile crane used for loading and unloading of cement. An unpaved area along the river bank is used for storage. Port dues are levied as follows: motor barges £.E. 2 per day, sailing barges £.E.0.50 per day, storage £.E.0,10 per ton per day.

Kima Port is used by the KIMA fertilizer factory. A concrete quay (120m long) provides two berths for barges. The port handled 60,000 tons of fertilizers. Handling equipment consists of a stationary crane of 20 tons and two conveyors.

River Transport Company port was originally built for the delivery of iron ore to Helwan. Part of the equipment (one belt loader, retrieval crane) is still used for loading of clay.

El Kebira provides for a landing place, located on the right bank of the river. It has no proper handling facilities. The port in 1978 handled 45,000 tons of limestone from a nearby quarry. Supply of limestone is by road.

Kom Ombo Sugar Factory Port belongs to the Sugar Company and serves the nearby sugar factory. In 1978 it handled 200,000 tons of sugar cane and molasses. The port facilities consist of three berths, one brick quaywall with a stationary crane on a turning platform. A private railway and a road connect the port with the sugar factory.

Idfu Sugar Factory Port is owned by the Sugar Company. Port facilities include one quay with concrete deck, a steel pipe supported platform and a concrete quay. These facilities are used for incoming cargo mainly sugar cane. A crane with 35 ton lifting capacity is used for cargo handling. Outgoing cargo, such as sugar and pulp, are loaded by conveyor.

Sibaiya Phosphate Mining Co. Port handled 154,000 tons of rocks in 1978. It has two berths, the mine is about 30 km from the port and the rock is brought by road. The equipment includes two conveyors used for shipment of rocks.

Nag'Hammadi Aluminium Co. Port has three berths. The equipment includes three cranes, two front loaders, and also a pipeline for pumping oil to the aluminium factory, 7 km from the Nile. Incoming cargo are cake and oil products. Outgoing are aluminium ingots.

Sohag River Company Port. An oil port run by the River Transport Company. Port facilities consist of a pier with dolphines equipped with a pipeline to a tank park, 4 km from the river. Transport capacity is provided by two pumps mounted on barges.

Asyut River Company port has a similar layout as in Sohag. The oil tank is at 3 km distance.

Asyut Power Station Port consists of a concrete pier equipped with apump and pipe connections for pumping oil to the power plant at a distance of some 500 m. There is also an 85 tons crane handling mainly construction materials for the cement factory.

Asyut Public Port is a landing place without facilities and equipment.

Minya River Company Port handled 205,000 tons of pertroleum products in 1978. Unloading of barges takes place via two pump barges moored at two T-head jetties.

Minya Public Port handles mainly cement and limestone. Handling is manual.

Helwan Steel Co. Port at Samalut handles limestone from the nearby quarry. Limestone is transported to the crushing plant by dump tracks. From there a belt carries the crushed limestone to the port storage area or direct into dump trucks. The port has two concrete quays, each having a berth length of 25 m.

Samalut landing place has no facilities and equipment. In 1978 it has handled around 200,000 tons.

Beni Suef port has a stone quay with very small storage area. No equipment is available. It handled in 1978 around 15,000 tons.

El Tabbin Oil terminal is located just north of the Helwan Steel complex port on the right bank of the Nile. It consists of 2 landing jetties linked by a pipeline with the nearby tank storage area. Each of the T-shaped jetties is approximately 20m long, and has 4 pipeline connections for the various products to be shipped (fuel, diesel oil, kerosine, oil, gasoil). Loading speed is in the order of 250 tons per hour. 800,000 tons were shipped from the terminal in 1978.

Helwan Steel Co. Port is the biggest inland port with 600 m of concrete quay (10 berths). The port equipment consists of one 15t crane for the handling of general cargo, five 16t gantry cranes for unloading of coal and two 15t cranes for unloading the limestone. The port is connected to the plant by internal rail and belt conveyors over a distance of three km. Around 1 million of cargo was handled in 1978.

Helwan Cement Co. port has four berths for barges carrying limestone. Unloading is manual into trucks for transport to the factory storage (15 km from the port). A modern cement handling terminal is under construction.

Ather El Nabi Port can be considered as the main inland public port in the country. The port area covers around 50,000m^2. An area of 15,000m^2 is available for open storage. It has a concrete quay of 450m length. The port has no equipment but shippers use their own mobile cranes. Cargo handled at the port includes limestone, fruits and vegetables, sand, bricks and other construction materials.

Ceramic Factory Port has no equipment. The handling is manual. The main cargo is kaolin (over 100,000 tons in 1978).

Hawandya Port is located south of Cairo. There are five berths for dry cargo. Main products handled are molasses, raw sugar, petroleum products and general cargo. The total throughput in 1978 was 700,000 tons.

Imbaba grain Port has two berths for barges. The unloading of bulk grain takes place by two 50 t/h elevators. Conveyors take the grain to the 50,000 tons capacity silo close to the waterfront.

Shubra Fertilizer landing place is used for landing phosphate rock. There are no port facilities or equipment and there is a lack of storage capacity. Direct loading into trucks is necessary.

Bolin is a landing place without facilities or equipment. Some 200,000 tons of cargo (120,000 tons of phosphate and 40,000 tons each of pyrits and sulphur) are unloaded annually and carried by trucks to the factory of Kafr El Zaiyat.

Norma is a landing place along the Mahmoudiya canal. The cargo handled is pottery clay. There are no facilities or equipment.

Mitras Port is located along the northern shore of lake Maryut. The port is equipped by a 30 tons crane to receive aluminum products from Nag' Hammadi. Around 15,000 tons of aluminium ingots are loaded for export.

Alexandria Port is a terminal point for river transport. The main products handled are coal, foodgrain, pyrits, sulphur (incoming) and molasses (outcoming). The coal terminal is equipped with barge loaders at the end of the two conveyors running parallel to the quay front with a capacity 200 t/h. At the grain terminal barge loading is possible from the silo or directly from the bulk carriers. Both systems have a nominal capacity of 200 t/h, each (2/3 x 200 average 130 t/h) for sea ship of 10,000 tons minimal two ships a day = 2 x 7.5 = 15 hrs x 130 t/hr = 2000 t/day.

The ports facilities are most times poor and do not comply with the efficiency and quality requirements of modern intermodal transport. It is not difficult to assume that the present situation causes that shippers and consignees seek relief from the existing problems related to water transport by switching over to road transport for most of their products. This however is basicly more expensive than water transport. It is therefore recommended that attention be given to upgrade the ports in such a manner that within the totality of inland transport water transport will again become competitive. This is necessary in order to secure that all the benefits of the low cost water transport will be conserved for the economic and social development of the nation.

1.1.15 Development policy in the 1978-1982 Five Year Plan

For the 1978-1982 Five Year Plan, the following summarised projects were proposed.

For the Cairo-Alexandria navigation link, investments totalling £.E. 30,1 million were allocated to complete the lock at the entrance of the Beheiriya canal and to construct industrial works along the waterway, and £.E. 18 million were proposed to reinforce the canal's embankments. Investments totalling £.E.10,2 million were allocated for completion of the floating dock in Cairo, the installation of Asyut lock gates, the purchase of units for the alarm buoys in the Nile, the installation of new locks for the Asyut barrages and improving Nag' Hammadi Services.

To other projects, investments were allocated totalling £.E.9,8 million to protect the banks of the El Kanak - El Sharki canal, to periodically clean the Tanta canal and to complete the signals of the Nasser lake floating dock.

Investments of £.E. 24 million were proposed for the river transportation companies to carry out the following:

- to renovate the engines and hulls of craft and supply work shops with machinery and equipment £.E. 8,7 million).
- to establish work-shops for the maintenance of the fleet (£.E. 2,7 million).
- to build 120 river units (£.E.12,1 million).

1.2 IRAQ

1.2.1 Navigational Aspects of River Network

a) Tigris River

The river Tigris flows over a distance of some 690 km from the Turkish border to Baghdad. The river passes through mountainous areas most of the distance with varying depths, often less than one meter, and with alternating speeds. Navigation upstream of Baghdad at an economic scale is at present unviables because of the high expenses required to make the river navigable, and the relatively low volumes of cargo to be carried between Baghdad and Mosul by the river. The present infrastructure of railways and roads is expected to easily provide the transport capacity required for the future between the central and the northern regions of the country.

Downstream of Baghdad, the river is navigable over the whole stretch till Karmet Ali where the confluence of the Tigris with the Euphrates occurs and from where both rivers together flow over some 160 km to the sea under the name of Shat-Al-Arab.

Basrah is Iraqi' major seaport located at the Shat-Al-Arab at 560 km from Baghdad and is at the same time the second important economic centre in the country. The Basrah-Baghdad corridor is the country's most important cargo transport route.

Water transport has played an important role at this part of the river throughout history and it might again become important when the river infrastructure and shipping will be adjusted to the requirements of modern transport. In such case the country will benefit economically from the low cost of long distance water transport.

The navigational aspects of the river between Baghdad and Basrah in the recent past were as follows:

From Baghdad to Kut, a stretch of 320 km, the navigation during the high water season has been carried out by barges upto 500 tons in combination with push boats. During the low water season however the navigation is limited because of the depths restrictions at various shoals. Besides some sharp river bends do also negatively affect the navigational conditions.

The dam at Kut was constructed in 1939 mainly for irrigation purposes. The lock built for navigation has a length of 70 m and a width of 16.5 m, and the operations of the lock is manual. The downstream sill at the Kut lock is limiting the navigation, due to its restricted depth. The minimum depth of 2 meters required for free passage of river crafts is available during some 230 days of the year. During the rest of the year (November till March) river crafts can pass the lock only with restricted drafts, minimizing the load factor of the vessels down to 50% of their capacity.

Between the Kut dam and Ali Gharbi, a stretch of 95 km, the river is in a regular condition but downstream it is under the influence of the water released from Qala Salih dam. During high water season, navigation between Kut and Ali Gharbi is carried out by units consisting of a fully loaded dumb barge of 500 tons and a push boat.

During the low water season the water level fluctuates, also because of the distribution of water for irrigation purposes, and can reach a difference of three meters. Navigation during this period is limited, due to insufficient water depth.

On the stretch from Qala Salih to Qurna two dams with locks are located. Locks at Qala Salih and Qassara are similar. Both have chambers of 50 meters length and 16.5 m width. The depth at the sill is 2.5 meters.

b) Euphrates River

The length of the river within Iraq is 1241 km. From the Syrian border till Hit, over 310 km, river navigation is not possible. From Hit downwards the river is passing through the Mesopotamian plain. Near Ramadi a barrage with a lock is located. The chamber length is 46 km and the width is 6 m. Minimum water depths of one to one and a half meter exist in this stretch.

From Ramadi to Hindiya, 180 kms, the minimum water depths at some places is only 1.5 m. Besides, navigation is hampered by small radius of river bends. From Hindiya to Kifil, 60 km, the level of the river depends heavily on the release of water for irrigation at the Hindiya barrage. Between Kifil and Nasiriya, the river is divided in various branches, the main stream has a width varying from 50 m to 200 m, and water depths of 1.5 m or even less can often be found on this stretch. 90 kilometers down from Shanafiya the two branches join again.

From Nasiriya to Qurna, the Euphrates passes through a marsh plain. Till Beni Said the width of the river varies from 80 to 140 meters and the water depth is around 4 meters. Down from Beni Said the river branches into three streams; the main stream has a width of 100 meters and a water depth of 2.5 m. A barrage with a lock has been constructed at the beginning of the stream. The navigation through the lock is only possible during the high water season since during the

dry season the available depth is reduced to only 0.85 m. The main stream flows into the Hammar Lake which is navigable. The Euphrates river joins the Tigirs at Qurna.

c) Shat-Al-Arab

Shat-Al-Arab is formed by the confluence of the Tigris and Euphrates. It flows from Qurna over some 160 km down to the Gulf. Its width varies from 200 m near Qurna to 1200 m near Basrah. There are no limitations for inland navigation on the Shat-Al-Arab.

1.2.2 River Transportation

The riverstretch of the Tigris from Mosul till Baghdad is not used for regular river transport. Before 1980, river transport between Baghdad and Basrah was carried out in relatively small volumes mostly by private craft. Due to the shortage or in most cases the absence of accessable statistics on the river traffic, it is extremely difficult to determine the real commodity flows.

Previously and for many areas of the country, the river has been essential for transport because of the absence of an efficient road and railway network, which has been established only around 1965. Import is playing a significant role in the country's economy. The imported cargo unloaded at the seaport of Basrah was carried up into the country by road, railway and river. During 1977, the river craft transported 287 thousand tons of imported cargo, and 233 thousand tons of export.

The share of the different modes in the transportation of import cargo from Basrah, during 1965-1969, was on average as follows:

the railway -40%, road -37% and river -23%. After 1970 the transportation of import cargo by the river craft declined down to only 5%. In particular the long periods of low water in 1965, 1967 and 1970 appear to have enhanced the role of land transport particularly the railway.

The available data on cargo traffic through the Kut Lock are given in table 15.

Table 15: Cargo traffic through Kut Lock in (000) tons

year	upstream	downstream	total
1955	229.0	260.2	489.2
1960	377.3	79.2	456.5
1965	222.0	199.3	421.3
1970	89.4	65.6	155.0
1975	36.6	37.0	73.6
1976	23.0	27.0	50.6
1977	20.1	28.6	48.7

Source : Government authority

The traffic changes through the year, apparently in conjuncture with the high and low water periods can be seen in table 16.

Table 16: Monthly fluctuation of river traffic through Kut Lock (1977)

month	number of craft			cargo in (000) tons				
	up	down	total	up (000) tons	average load per vessel tons	down (000) tons	average load per vessel tons	total (000) tons
January	7	11	18	n.a.		2.0	182	n.a.
February	23	9	32	4.4	192	1.9	211	6.3
March	18	20	38	2.2	122	2.4	120	4.6
April	21	21	42	2.4	114	4.5	214	6.9
May	25	27	52	4.6	184	4.3	160	8.9
June	33	25	58	4.3	130	3.5	140	7.8
July	5	17	22	n.a.		3.6	212	n.a.
August	7	6	13	0.7	100	1.1	183	1.8
September	6	9	15	n.a.		1.7	188	n.a.
October	14	4	18	1.6	114	0.7	175	2.3
November	6	11	17	n.a.		1.6	145	n.a.
December	5	9	14	n.a.		1.5	167	n.a.
Total	170	169	339			28.8		

n.a. : not available information

Source : Government authority

Some 70% of all downstream cargo is moved within six months time (February,- July). In 1977 the average load per vessel was 158 tons; upstreams 143 tons and downstreams 170 tons, and the used capacity of the fleet was around 40%.

Transit traffic on Euphrates does not exist. However craft of 100 or 200 tons could be used for transit traffic since the existing locks have limitations for the passage of bigger craft. Furthermore navigation took place in some stretchs in Nasiriya and Hindiya areas but data on volume and type of cargo transported is not available. It might be suggested that due to road construction in these areas the river cargo traffic may remain negligible.

1.2.3 River Fleet

The river fleet before 1980, consisted of different kinds of craft, and its composition is given in table 17.

Around 93% of the fleet belongs to the private sector. Most of the private fleet is obsolete, and many crafts have been in service for more than 50 years.

The publicly owned fleet consisted of 37 tugs of 544 hp and 53 tug barges of 500 tons, see table 19. These types of craft were imported from Yugoslavia.

Table 17 : Composition of River Fleet (1977)

type of craft	number of craft		
	publicly owned	privately owned	total
Motorized craft			
Self propelled barges	6	14	20
Motorized boats	71	1045	1120
Tugs and steamers	37	44	81
Sub total	114	1107	1221
Non-Motorized			
Tug barges	53	408	461
Ferry-boats	--	98	98
Sailing boats	--	660	660
Sub total	53	1166	1219
Total	167	2273	2440

Source : Compiled by ECWA/TCTD on the basis of available data.

Table 18 : Particulars of non-motorized private fleet (1977)

barge capacity in tons	barge dimensions(m)			draught when fully loaded (m)
	length	width	height (side)	
Up to 100	24.9	5.0	1.3	1.07
101 - 200	35.1	6.2	2.0	1.37
201 - 300	46.0	6.1	2.0	1.52
301 - 400	48.9	7.8	2.0	1.68
401 - 500	48.8	7.7	2.5	1.98
501 - 600	45.8	9.9	2.6	2.29
601 - 800	48.8	9.2	2.9	2.44

Source : Compiled by ECWA/ TCTD on the basis of available data.

Table 19 : Particulars of public craft

type of craft	h.p.	capacity tons	dimensions of craft (m)			draught (m)	
			length	width	height of side	empty	loaded
Push boat	544	--	16.0	6.2	3.0	0.7	0.9
Barge	--	500	48.0	9.0	1.8	0.3	1.5

Source : Government authority.

Self propelled craft and steamers with barges of 500 tons were used for the carrying of cargo between ports of Basrah and Umm Qasr in Iraq and some seaports in the Gulf. The barges of 400-500 tons were engaged in river transportation between Baghdad and Basrah. On some sections of the Euphrates, downstream of Nasiriya, barges upto 400 tons capacity were also used for the trasnportation of construction materials and agricultural products.

Due to the depth restrictions during the low water season, most of the fleet could not operate efficiently, because of the low load factors and the increased time for transportation caused by waiting for the periodic release of water into the river by the irrigation authorities.

1.2.4 River Ports

The main ports on the Tigris river are located in Baghdad, Kut, Amara and Basrah. The cargo transported to and from these ports consisted mainly of construction materials, grains, mineral products, and dates. No records were kept on the volumes which passed through these ports.

In Baghdad there were two specialized quays for cement, and grain. A new river port was planned to be constructed in Baghdad with a quaywall of 160 m and special facilities to handle around 500 thousand tons of cargo per year. In Kut port facilities consisted of a quay and special equipment for the handling of grain unloading and storage. Many small ports are situated along the Tigris and Euphrates rivers which are merely of local interest. In most cases no quays or equipment exist and cargo handling is manual.

1.2.5 River Transport Costs

The cost of river transport is calculated on the basis of the cost of capital investments expressed in depreciation of tugs and barges, and the cost of fleet operations including the costs of fuel and lubricants, crews, over-heads, maintenance, etc.. Account should be taken of the allowable draught and related vessel capacities, the distnces between river ports etc... The main objective behind calculating the cost of river transport is to correlate and to compare with the cost of transport by rail and road.

Accordingly, in 1974, the cost of transportation by different modes between Baghdad and Basrah as calculated by the Ministry of Trade were as follows:

transport mode	transport costs in fils per ton kilometer
Rail	16.14
Road	10.60
River	7.30

Based on this review the Ministry of Trade has recommended the transport tariffs for various commodities per transport mode. These tariffs are shown in table 20.

These tariffs reflect that the costs of river transport, even under the restricting conditions, were lower than for rail and road transport. Therefore it is worth to investigate the extent to which the waterways can contribute to the total volume of commodity transport in the country.

Table 20: Transport tariffs for various commodities per transport mode between Baghdad and Basrah

type of cargo	transport tariffs (ID/ton)		
	rail	road	river
Grain, gravel	--	--	1.500
Dates	1.620	3.560	1.750
Cement, Sugar	2.160	3.500	1.750
Fertilizers	4.330	3.560	1.500 - 1.750
Oil products	5.690	6.020	1.500 - 1.750

Source : Government authority.

1.2.6 The transport capacity of the Tigris river

The existing capacity of the Tigris as waterway is not fully utilized. For an estimate of its transport capacity the following assumptions have been made. The time needed for a roundtrip Basrah - Baghdad - Basrah is assumed to be two weeks, and is compiled as follows: one day for loading in Basrah, six days for moving to Baghdad, two days for unloading and loading in Baghdad, four days for sailing to Basrah and one day for unloading there.

Assuming that navigation could be made smooth throughout the year by canalisation works in the river, a large unit would theoretically be able to make 26 roundtrips a year. When taking into account that in the present situation 25% of the time is lost for maintenance and other requirements, the barge units could produce 20 roundtrips per year. Assuming that barges of 500 tons are used and the average utilized capacity to be 75%, the average cargo transported would be 375 tons per barge.

The Kut-lock can be taken as the governing factor determining the present capacity of the waterway. Provided that the electric equipment is installed for the mechanical operation of the lock doors, the lock would provide a capacity of one barge in each direction, every 45 minutes. If the lock is operating during 12 hours a day during 250 days a year, a maximum of 8000 barges could pass per year. Thus the capacity of the waterway in one direction could be calculated as 4000 x 375 tons + = 1.5 million tons per year.

This is only an estimate, the real outcome will among others depend on the homogenity of ship types using the lock, the schedules in which the ships present themselves at the lock, the real load factor of the ships, the design of the new units and their cargo capacity, etc. Nevertheless, this calculation gives an indication on the waterway capacity, based on its present infrastructure. Further improvement of the infrastructure, including the construction of new locks, capable of handling bigger ships or units consisting of more barges, the introduction of night navigation would definitely contribute to increase of the waterway capacity.

1.3 PROBLEM AREAS

In the field of rivertransport development, the following problem areas can be identified with a view to develop an efficient and competitive inland water transport capable of serving decentralized economic and social development in the country.

The problems listed are the most pressing ones and their solution would allow the inland waterways to play their important role in the national transportation. They are more or less interrelated and solving them will be most effective if developed in a framework of concerted actions. These are:

1.3.1 River infrastructures and uses

Rivers serve a combination of interests, including irrigation, hydropower and navigation, and these interests may often conflict with each other.

Rivers are basicly utilised to serve irrigation and boost agricultural production within their basins. Hence the development of river infrastructures for the promotion of the transport function has to be carefully tuned tothe irrigation use of the water as well as other various interests.

The interests of water transport and of irrigation are often the responsibilities of different authorities. In order to arrive at a balance of interests, it is recommended that a coordinated approach be established, supported by a team of engineers and technicians, advising the authorities concerned on information and forecasts as well as carrying out all works required for the improvement of the river regime. Such a team might include experts from qualified national bodies, such as technical universities, scientific institutes, and public works departments. A possibility for an exchange of experts within the framework of TCDC could also be considered and regional bodies should also be utilized.

1.3.2 River infrastructure constraints

In Egypt the river traffic is concentrated on the Aswan - Cairo - Alexandria corridor. There are some major bottlenecks for river transport along this stretch. These are: the Nag' Hammadi lock in the Upper Nile, the shoals in the lower part of the river Nile and in some sections of the Nubariya canal, where the navigation conditions are deteriorating due to bank erosion.

There are quite similar bottlenecks in the river Tigris in Iraq. The lock at Kut poses its limitations on river transport, and the shoals in the river stretch between Baghdad and Kut as well as the sharp river bends impose their own limitation.

To encounter such constraints, it will be necessary to have a technical team to look on behalf of the river authority, into all the constraints and to provide alternatives for short term and long term solutions. The technical team should be the consulting engineer for hydrological surveys, for dredging operations, river engineering, and traffic management. The tasks of this team would be to :

- identify all the technical constraints for the development of modern river transportation,
- to propose short term solutions for improvement of the existing situation, and
- to propose alternatives for long term phased solutions in a comprehensive master plan for the river development.

1.3.3 Manpower

There is a general lack of qualified manpower at all levels in the river transportation sector. The problem is demonstrated by the fact that a large part of the riverfleet in Egypt is out of service for several months of the year. There are the technical reasons of insufficient maintenance of the fleet as well as economic ones. Similarly the operations of dredging and other maintenance activities of the river infrastructure are also affected by the lack of expertise required. Among the reasons for this situation may be the lack of incentives and career development for personnel of river authorities and river transport companies, which lead to a lack of interest as well as an outflow of personnel to more attractive jobs outside.

There is no training centre in the region for the training of inland waterway transport personnel. Without training institutions which could develop the various categories of personnel from crew levels upto managerial levels, the successful introduction of any new technology into the river transport service industry will be very difficult.

Manpower development is a key element in the development of inland waterway transport and has to receive more attention from the authorities concerned.

However, arriving at results of training is a long term affair, and institutionalised training has, therefore, to be directed to the needs of the future. For the immediate improvement of the present situation, a provisional programme for training concentrating at minimizing the negative affects of low skills, smoothing bottlenecks rather than to maximizing skills, is urgently needed.

It is recommended that such a provisional training programme be set-up. Simultaneously an institutionalised training programme, following a survey of the long term requirements for qualified personnel, has to be prepared.

The initiative could be taken by the River Authority in consultation and collaboration with river companies, port administrations and others concerned. The Maritime Academies in Alexandria and in Basrah may both advise and provide the necessary assistance for establishing training capacity in their respective countries as well as for other countries in the region.

1.3.4 River Fleets

Most of the river fleets of the Nile and the Tigris were built abroad and consist of different types of craft causing problems for standardization and efficient maintenance of the fleets. Most of the private fleet is old and often obsolete. The present navigational situation does not allow the fleets to be efficiently utilized during some periods of the year and many ports lack the facilities and the equipment to facilitate modern cargo handling and storage. These, together with the lack of planned marketing for the optimum use of the fleet capacity, are the main causes for the under utilization of the fleet capacity and consequently the relatively high costs. In such a climate there is little incentive for fleet development.

It is, therefore, essential that the fleet development be related to the possibilities of improvement in the river and port infrastructures and a comprehensive market study on the various cargo commodities that could benefit from the low cost of water transport. It is recommended that simultaneously some research be carried out on the possibilities of introducing new ship designs, and modern systems for cargo handling and transport.

1.3.5. River Ports

Many river ports in Egypt and Iraq lack adequate ship berthing facilities and cargo handling and storage capacity. Furthermore the port infrastructures are often in a rather poor state.

River ports have to play a key role in modern intermodal transport and therefore to provide the necessary facilities for both river transport and the hinterland transport modes. Providing for ample storage capacity is essential for fulfilling its technical buffer-function as well as its commercial function of facilitating trade.

There is a clear need to review the infrastructures and facilities of the river ports in relation to the requirements of modern intermodal transport. The market study recommended for fleet development and the study on the possibilities of introducing new ship designs and cargo handling and transport systems will form an important input for the review.

For the immediate improvement of the present situation in the ports, the execution of a provisional action plan directed at solving the most pressing bottlenecks in the ports is urgently needed.

1.3.6. Planning and Coordination

There is no special body in both countries of the study responsible for planning and research in the field of inland waterways. Studies have been so far conducted by teams of foreign experts. This however does not provide for the continuity and the consistency which is required for the ongoing process of development.

It is therefore recommended that within the Inland waterway administration in the ministry of transport a planning unit for inland watertransport established. Because of the technical and operational aspects, such a planning unit might best be placed within the organization of the River Authority. Although for certain aspects foreign exports may still be needed, the planning becomes in principle an ongoing inhouse activity of the responsible authority. And from that point a more consistent contribution can be made to the national development plans.

The task of the planning unit should include:

- the planning of infrastructures for inland waterways and ports, technically and economically,
- the planning of fleet capacity development,
- the forecasting of transportation demand to the planning horizan, commodity wise,
- the planning of a framework for cost recovery,
- the forecasting of employment generation in administration and management of waterways, in administration and operation of the fleets, in port operation, in support services, in shipbuilding and shiprepair,
- the forecasting of energy conservation in comparison to other transport modes,
- the forecasting of foreign currency savings in comparison to other transport modes.

These elements will be used for defining of priorities, investment policies and new tariff sturctures.

1.4 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

River transportation in the region has traditionally been a dominating mode of transport. It was only recently that it lost much of its position. In particular in those areas where water transport did not keep up with the modern transport requirements of reliability, frequency and quality of the services, the advantages of low cost water transport gradually disappeared and consequently, much of the cargo has been switched to road transport, even though it lends itself by its nature perfectly for water transport.

In this respect it is relevant to compare with other regions, where river infrastructures have been improved and river fleets have been developed in accordance with modern requirements. Examples of importance can be found in Europe and North America, where the inland water transport sector is providing an important share in the total volume of modern bulk transport, notwithstanding strong competition among the various transport modes in those regions.

The river systems of the Nile and the Tigris do provide the potential for an equally important share in transport in the ECWA region. But it needs an entirely new approach at the national level as it requires major capital investments in river and port infrastructures, an important reconstruction of the river fleet in the near future by its owners, a restructuring of the river transport organizations, in accordance with the requirements of modern intermodal transport management, the development of a highly qualified manpower, the establishment of water transport support facilities and services, and the provision of sufficient legislation supporting the development of modern inland waterway infrastructures and water transport services and encouraging the required investments in all sectors concerned.

This is a comprehensive longterm project which will need a definite national policy on the matter in order to obtain the necessary concerted action of all parties concerned. In order to define the national policy it is suggested that the elements for such policy be presented for consideration in a "masterplan for

the Development of Inland Water Transport". This Masterplan could consist of two major interrelated parts, namely:

- a masterplan for the development of the inland waterways and port infrastructures, and
- a masterplan for the fleet development.

The two plans together could cover all the elements earlier mentioned in this chapter.

Recommendations

1. A basic factor required for the long term planning of transport infrastructures and fleet development and for the short term planning of transport operations is statistical data. Shortcomings of the inland waterways statistics in the region do not allow to observe the real development in this transport mode. In this respect one of the urgent tasks is to set up a unified system of inland waterways statistics.

2. One of the main obstacles for the development of the river transportation is a lack of adequate manpower in various sectors and at most levels. For the immediate improvement of the present situation it is recommended that a provisional training programmes concentrating at solving bottlenecks rather than maximizing skills be undertaken. Simultaneously, an institutionalized training programme, following a survey of the longterm requirements for qualified personnel, has to be prepared. The existing maritime training institutes in Alexandira and Basrah could provide advise and assistance for such a project.

3. The present river fleet has been imported from abroad without much specifications taking into account the existing local navigational conditions. As a result the fleet efficiency is much too low. In this respect it is recommended that based on the experiences with the existing fleet, new ship designs be developed which could make an optimum use of the existing local conditions. The possibilities of a national manufacturing of inland waterways craft, equipment and spare parts could be included in the studies.

4. Most of the river ports in the region do not provide the facilities needed for an efficient modern water transport. It is therefore recommended to review the existing infrastructures and facilities of all river ports, which will serve as a basis for a masterplan for the up grading of the ports for modern inland shipping.

Bases for such a plan for ports has to be the concept of integration of transport from the production centres to its final destination. The storage capacities at all transit stations have to be related in order to guarantee the efficiency of the total transport chain. Accordingly the river ports will have to modernize and to extend their storage facilities. Many ports do not have adequate quays of sufficient length for safe ship berthing. In this respect it is necessary to build up new quays and ship parking facilities in some pivotal ports. In some local ports investments in extensive quays may not warrant a return of capital in the near future because of the low cargo volume. These ports have a local function and cargo is mainly destined for consumption in its immediate vicinity. In such cases much attention has to be given to low cost berthing facilities along jetties and to simple landing places for passenger ferries. The capital investments in such facilities have to be financed by the River Authority within the framework of the overall capital investment budget of the river administration.

5. At present the river navigation is carried out during the day time. The possibility of night navigation will considerably increase the transport capacity, which may be required in certain peak seasons. The introduction of night navigation will require changes in operational management, adjustments of the ships, training of crews in the use of equipment for night navigation, special beacons and lights for the waterway. But the total investments may be relatively low and it is recommended that the possibility be included in the plans for improvement of the river infrastructures and the increase of the transport capacity of the fleets.

6. The bulk of river traffic in Egypt is carried on the Aswan-Cairo-Alexendria corridor. A major bottleneck for navigation on this corridor is formed by the shoals in the lower part of the Nile River and in the Nubariya canal. It is recommended that short term improvement of this situation be sought by increased capacity of the dredging fleet. The first measures towards this aim will have to include an optimization of the output of the existing dredging fleet by improvement of the overall organization, among others by maximisation of the working hours, the methods of operations and its planning. This will have to go together with the improvement of the maintenance of the fleet, in an effort to reduce the "down time" to an acceptable minimums, by provisional training of operational and maintenance personnel.

A long term plan will have to include dredging fleet development in accordance with the outcome of hydrographic surveys and proposed river engineering works to stablize the river bed in the navigation channel.

7. Many units of the river fleet in Egypt, due to poor operations management, appear to be out of service during several months of the year, which is detrimental to the reliability and the cost of water transport operations. It is recommended that this problem be given priority. Methods for improvement are: The provision of training courses at management level in optimization of fleet operations and at crew level in daily operations and maintenance of ships. Incentives may be necessary in the form of improvement of working conditions and the introduction of an appropriate career development for personnel. Attention should also be given to the up-grading of existing ship repair facilities and maintenance workshops at appropriate locations along the waterway.

8. In Iraq the navigation at an economic scale on the Tigris river between Mosul and Baghdad will not be considered. The improvement of the infrastructure of the river Tigris and the Shat-Al-Arab between Baghdad and Basrah, however, will contribute to the country's economy because of the important river capacity and the need for low cost transport of large quantitieis of bulk cargo between both cities.

In order to restore the river transport capacity at the level of the sixties and the early seventies, it is recommended that as a first step the river infrastructure be improved in such a way that an optimum output of the existing the river fleet will be achieved. One of the first measures will be to concentrate on dredging, for which it will be necessary to optimize the output of the existing dredging fleet by imrpoving of the overall organization (maximization of the working hours), the methods and the planning of operations. This will have to go together with the improvement of the maintenance of the fleet and with an appropriate training of operational and maintenance personnel.

9. The existing locks on the Tigris may create obstacles for the future fleet development and traffic increase. The dimensions of their chambers are suited to accommodate barges upto 500 tons, together with a tug. The major problems is the Kut lock due to the limited depth at the sill of the lower head. Reconstruction of this lock is required in order to guarantee the passage of fully loaded ships throughout the year. Improvement of the lock capacity might also be achieved by introducing operations during the night. This will require special lights and markations, training of personnel and orgainisational adjustments.

10. The navigation conditions of the shat-Al-Arab river do not provide major problems. Its transport capacity could be easily improved, if so required, without heavy investments through introduction of night navigation. The investments in such case are required mainly for markation of the navigation channel, for some adjustments of the navigational equipment of the fleet, for training of personnel for night navigation and for reorganisation of operations.

11. The river fleet in Iraq consists of different types of vessels. The private fleet is mainly old and obsolete and needs urgently modernization for playing its role in the revival of inland waterway transport. The publicly owned craft might still be transformed for more efficient inland water transport.

It is recommended that a study be undertaken comprising two parts, one investigating which units of the existing fleet can economically be adjusted for reactivation of inland water transport between Basrah and Baghdad. The second part

investigating which new ship type or combination unit could be most successfully introduced for future inland water transport and which infrastructural adjustments will have to be made for that purpose in the river.

12. In the financial field it is recommended that a flexible tariff structure should be worked out for river transportation. This structure should be based on the real costs of transportation and the coverage of the maintenance of the river infrastructure. It is also recommended to develop a unified system of port dues and levies, which could meet the maintenance costs of the present and future port infrastructures.

13. One of the problems which the river transportation faces in an unbalanced load factor. In this respect it is recommended to introduce an appropriate marketing mechanism for promotion of an optimum use of the fleet capacity.

14. It is recommended that a " Planning Unit " for inland water transport be established.

1.5 PROJECT IDENTIFICATION

For the development of inland water transport, the following projects could be considered:

1. A Project for a Long-term Technical Assistance programme for the Development of Inland Waterways and Related Transport

In the previous chapters an indication has been given of the wide range of areas which are in need of improvement in order to establish an efficient water transport service. The areas cover technical, economical, operational, commercial, and social aspects as well as those of general administration and related legislation. No doubt there is room for short-term improvements which are necessary to contribute to an increased productivity and efficiency in water transport, to keep up with the needs.

Simultaneously there is a need for a long-term development of inland water transport in order to make the optimum use of its characteristics namely:

- great capacity per unit,
- low cost per ton kilometer production,
- low energy consumption per ton kilometer production,
- relatively low foreign currency component in capital investment in transport units compared to land transport,
- relative low foreign currency component in maintenance of the transport units,
- low maintenance costs of the infrastructure,
- high capacity of the infrastructure.

In this respect it is interesting to compare the latest transport figures on the river Rhine, which show that in 1982: 124 million tons of freight have been carried by 120,612 ship-movements across the border of the Netherlands and West Germany, indicating an average cargo of 1,028 tons per unit.

A long-term development aimed at modernisation of the waterway and its fleet needs a concerted action of the public sector responsible for infrastructure, administration, legislation and employment generation, and the private sector responsible for equipment and operations. Investments in long-term developments in both sectors are all interrelated and need therefore to be integrated in a master plan.

In order to prepare for such concerted action the need for long-term technical assistance in the various sectors has to be identified. It is recommended that, rather than consultancy in individual fields of the complex of waterway and transport development, such assistance might well be given the form of an "umbrella-project" based on a possible three to five year co-operation with a country which is maintaining a well developed inland waterway infrastructure and has a long standing tradition in inland water transport development.

Such an "umbrella-project" could consist of an exchange programme of key personnel for various subjects which may include:

- inland waterway administration and legislation,
- technical planning of inland waterways, including water-management, design and execution of public works,
- the nautical and technical aspects of inland navigation,
- the aspects of the fleet operation and cargo movements,
- fleet design, construction and maintenance,
- the economic aspects of inland water transport,
- port development,
- training of technical and operational personnel.

The possibilities of such a long-term co-operation needs to be carefully investigated and formulated. It is suggested that the preparation of such an "umbrella-project" might be executed as a UNDP assisted project, in the implementation all other relevant bodies concerned will be involved.

2. The following short-term projects are mentioned to indicate the various areas where in technical assistance could be provided. These areas include:

a. The improvement of navigational conditions on the river Nile.

b. The improvement of navigational condition on the river Tigris.

c. The improvement of the operational efficiency of the existing river fleet.

d. The establishment of a shipbuilding where and of maintenance facilities for river crafts at strategic points.

e. The preparation for night navigation on the Nile.

f. The establishment of training programmes for the river transport personnel.

g. The improvement of the infrastructures, the facilities and the operation of the river ports.

h. The introduction of essential information systems for the inland waterways.

i. A case study for an intermodel transport package for a specific commodity based on river transportation.

Part Two

II. COASTAL SHIPPING AND SHORT-SEA SERVICES

2.1 Types of Coastal Shipping and Scope of Operations

Coastal and short-sea shipping is in a critical stage of development throughout the world. New systems of cargo movement and methods of cargo handling are being introduced at a time of severe competition among all transport modes. Shipping services in coastal areas are frequently replaced by railway and road services, the latter sometimes in combination with RO/Ro ferry services, which offer a higher frequency of scheduled sailings between ports of call. On the other hand new areas in developing countries became open for frequent and reliable shipping services.

Coastal shipping is defined in different ways in the various countries, often caused by historically different types of trades. Coastal or coastwise shipping are terms which appear to be synonym to domestic shipping in which case indicating shipping between ports in the same country. In the United States, for example, coastal shipping is defined legally as the traffic of goods and passengers between domestic ports. Often it is also referred to as "cabotage" or "inter-island shipping".

In some European countries coastal shipping trade indicates a distinction of all sea borne traffic conducted by ships upto 500 gross registered tons, or in some cases all sea traffic carried out by ships not longer than 75 m overall.

In the example of the Soviet Union, coastal trade consists of two parts, the so called "big coasting" and "small coasting". Big coasting covers the trade between the four separated Soviet sea-areas: The Black Sea, the Baltic Sea, the Arctic Ocean White Sea and the Pacific Ocean. Small coasting comprises coastal shipping within each of the above mentioned areas.

A similar situation exists in Saudi Arabia where big coasting is understood to be the carriage of cargo between the Gulf and the Red Sea areas, and small coasting is understood to be the transportation within either the Gulf or the Red Sea area.

In countries with a long coastline, coastal shipping is traditionally a natural means of transport. Typical examples are countries like Oman in the ECWA region and the Scandinavian countries in Europe.

Feeder services may be defined as services which connect a pivotal major port with neighbouring ports with the purpose of connecting the cargo potential of their hinterlands with the liner services calling at the major ports. The function of feeder services is gaining importance with the ongoing specialisation in maritime transport and is most visibly linked with, among others, the container traffic and bulk transport, both requiring specialised port facilities and equipment, as well as intensive support services, which can only be economically justified in the major pivotal ports. The smaller ports, served by the feeder services are in fact getting linked with the economy of scale of modern technology in maritime shipping provided by the major ports in the region. In this new role the smaller ports are enhancing their importance for economic development of their hinterlands.

Coastal shipping has always played an important role in the ECWA region where most of the population is concentrated in and near cities in coastal areas. The recently developed road network has confronted coastal shipping with an alternative transport mode which, though basicly more expensive, has taken the biggest share of the transport volume, because of its flexibility. In order that coastal shipping will survive and continue in providing the region with a valuable low cost transport alternative, it will be necessary that sharp competitive services in a modern integrated transport system be provided. High quality standards, reliable and frequent sailings, and adequate support services will have to be offered in one package for a reasonable tariff.

Such services will be important in particular for products with low unit value among which petroleum, cement, grain, fertilizers, foodstuff, salt, sand and others which need to be transported over longer distances. To these types of cargoes generally the costs of transport have a high impact on the consumption market price.

Apparently in most of the countries the coastal shipping and its port facilities have not been included in the national development plans and without special national bodies responsible for the promotion of coastal shipping services and the development of coastal fleets, the available information on coastal shipping is rather scanty. It is highly recommended that adequate attention be given to coastal shipping and coastal ports within the national plans as part of the integrated transport network of the country.

It is also recommended that within the appropriate government ministry some capacity will be allocated for and be put in charge of the preparation, together with the appropriate parties involved, of the plans for coastal shipping development and related legislation, as well as supervising the implementation of the policy adopted.

Vessels in coastal services are traditionally flexible in their areas of operations, they operate along the national coast as well as on routes connecting the home country with neighbouring states. Coastal and short-sea shipping are therefore in practise closely related and therefore the term "coastal shipping" used in this report, will cover both forms of water transport.

The four distinct areas where traditionally coastal shipping exists are the Mediterranean, the Gulf, the Red Sea and the Arabian Sea. In the last three areas, coastal shipping has traditionally been performed by typical Arab wooden sailing vessels known as Dhows. These dhows have a limited cargo carrying capacity averaging some 100 tons per dhow and require only simple port facilities. Besides they are very environment friendly. Later

motorised vessels have been introduced, which have gradually moved the role of the smaller dhows to a secondary one.

In the Mediterranean the coastal shipping is somewhat different from that in the rest of the region. Historically Egypt, Syria and Lebanon sustained regualr links with most countries of the Mediterranean. This has accelerated the introduction of new technologies into the pattern of short-sea services. Although here also the vessels are mostly second hand, and many of them have become rather old, obsolete and close to the end of their economic life, the Mediterranean pattern of coastal trade may be considered more developed in comparison with the rest of the region.

The majority of coastal fleets employ small vessels in short voyages. However, occasionally these vessels carry goods across more than thousand miles of open sea. Variation in the demand for transport in the various trades makes that individual ships are frequently switched from one trade to another.

2.2 Types of ships and operating environment

The fleets engaged in the coastal shipping in the countries of the region are composed of a great variety of vessels. There are modern cargo and passenger vessels, passenger and car ferries, coaster tankers, and the more traditional motorised cargo vessels. The traditional Arab wooden sailing vessels, the dhows, form a special category.

The physical and economic conditions of coastal shipping operations and the type of crafts involved differ from country to country. Inspite of these differences, the coastal fleets have certain common features which may be characterised as follows:

A shortage of capital in the industry has been a major cause that the ships, being acquired abroad, were second hand. The majority of the vessels, used for coastal shipping are of the general cargo type. Being acquired second-hand, they vary in size in type of equipment and machinery. This is

affects seriously the efficiency in maintenance and up-keep of these vessels and the necessary standardization of cargo handling. As a result the operation costs of these ships are relatively high which problem is often combined with long non-operational periods, the so called down-time of the vessels, awaiting repair and spare parts. This is reducing the productivity of the ship and the possibility of internally generating of the funds necessary for fleet modernisation.

A difficulty in standardizing the fleet is that the vessels are scattered among a great number of companies, most of them owning only one or two ships.

As far as coastal trade is concerned, the scattered ownership is causing the absence of regular and reliable sailing schedules, which are a basic requisite for building up an efficient competitive low cost coastal transport service.

The ports, which are key elements in intermodal transport, often reflect the status of the shipping industry. Efficient port operations require investments in port facilities, equipment, manpower and a network of back-up services, the quality of which is often decisive for the shippers' choice of the transport mode. Such investments however can only be justified for a reliable pattern of efficient shipping services. As long as the coastal shipping does not respond to such requirements, the port facilities and operational services may remain poor. Steps will have to be undertaken to break this vicious circle.

The negative effects of the present situation of scattered ownership, of a rather old and diverse coastal fleet are summarized as follows:

- The services to the various destinations are not regular and reliable.
- The quality of the crews of the ships is poor.
- The maintenance of the ships is poor, which increases the ships' down-time.
- The quality of cargo handling is poor, which increases the rate of damage, pilferage, and causes quality deterioration.

- The costs of marine insurance are high.
- Cargo group age can not be efficient as it can not be planned.
- Timely arrival of cargo at destination can not be guaranteed.
- The turn over of capital,vested in the cargo, is very slow.
- The net earnings of the shipowner is low, leaving for little room for the generation of funds for fleet modernisation.

A break-through might be found in a complex of concerted actions, each tackling one of the negative effects of todays' situation. Such actions should include:

1. The planning of a schedule of reliable and frequent sailings complying with the transport demands for each destination. This could be arranged through association of the shipowners in one,or at least a limited number of cooperative shipping management organisations.

2. To arrange adequate cargo group age services in relation to the regular sailings.

3. To gradually standardize the ships and engine types for simplification of ship maintenance and repair and bringing the down-time back to a minimum and minimizing the ship operating costs.

4. To modernize the fleet in accordance with the requirements of the commodities to be transported.

5. To provide the necessary port facilities and to arrange cargo handling and storage operations in a way that reduces the time of ship-in-port, and improves the quality of cargo handling.

6. To introduce back-up services to accomodate efficient intermodal transport.

7. To develop training facilities for ship crew and for port operational personnel and cargo agents.

8. To develop ship maintenance and repair facilities and services at strategic locations.

9. To reduce marine insurance tariffs by appropriate measures.

10. To introduce a system for the liability for the cargo throughout the intermodal transport chain, for which the "Hamburg Rules 1978" is giving guidelines.

2.3 PRESENT SITUATION IN THE REGION

The following paragraphs contain a review of coastal traffic and the inventory of the coastal fleet per country.

The estimates of traffic have been calculated on the basis of foreign trade statistics and data collected during the mission country visits. The information supplied by the national authorities as well as the official publications have been used for the description of the fleets. It has to be completed emphasized that due to a structural lack of consistent data, it was not possible to arrive at a detailed analysis on the matter of coastal shipping within the region.

2.3.1 BAHRAIN (population 380,000)

2.3.1.1 Coastal Traffic Flows

The country consists of an archipelago of small islands situated about half-way down the Gulf some 15 miles from the Arab coast. There are six principal islands in the Bahrain group, the largest is Bahrain itself which is about 30 miles long and 8 to 10 miles wide.

Bahrain's central position in the Gulf has made it natural commercial centres for the whole area. Cargoes carried in ocean-going vessels are brought to Bahrain and either transhipped into coastal craft or barges, destined for Saudi Arabia in other Gulf states or stored in warehouses subsequently re-exported. Information on the volumes of import and export in coastal and short sea trade is shown in table 21.

table 21. Bahrain Coastal and Short-Sea Traffic

	Imports						Exports/Re-exports					
	1976		1977		1978		1976		1977		1978	
	(000) ton	%	(000) ton	%	(000) ton	%	(000) ton	%	(000) ton	%	(000) ton	%
Iran	20,5	11.8	23,0	7.1	23,5	6.2	7,9	5.5	18,4	11.7	31,0	16.0
Iraq	1,5	0.9	2,7	0.8	11,3	2.9	4,5	3.2	15,2	9.7	6,1	3.2
Kuwait	6,9	4.0	4,0	1.2	8,4	2.2	2,3	1.6	18,0	11.5	15,1	7.8
Oman	0,4	0.2	0,8	0.2	0,8	0.2	9,5	6.6	0,5	0.1	0,1	--
Qatar	1,9	1.1	1,3	0.4	1,9	0.4	5,2	3.6	10,8	6.9	1,3	0.7
Saudi Arabia	18,6	10.7	7,8	2.4	12,3	3.3	104,4	73.2	89,3	56.9	27,4	14.2
UAE	123,6	71.3	228,0	87.9	324,1	84.8	9,0	6.3	5,0	3.2	112,6	58.2
Total	173,4	100	327,6	100	382,3	100	142,8	100	157,2	100	193,6	100

Source: Compiled by ECWA/TCTD on the basis of national sources.

Total imports to Bahrain in coastal trade increased from 173,4 thousand ton in 1976 to 382,3 thousand ton in 1978 (plus 120 per cent). At the same time the total volume of exports and re-exports grew from 142,8 thousand ton in 1976 to 193,6 thousand ton in 1978 (plus 35 per cent).

The UAE occupied the leading place in Bahrain's coastal trade and accounted for more than 80 per cent of imports and 58 per cent of exports and re-exports in 1978. Iran was the second, accounting 6 per cent of imports and a corresponding increase in 16 per cent of exports. The share of Saudi Arabia in the imports decreased from 15.7 per cent to 1976 to 3.3 per cent in 1978. During the same period, exports and re-exports to Saudi Arabia decreased sharply from 73 per cent to 14 per cent.

2.3.1.2 Coastal Fleet

Most of Bahrain's imports and exports are carried by foreign vessels. The Bahrainin coastal fleet in 1978 consisted of 32 vessels with a total of 4.989 dwt. They are mainly tugs, service craft and few coastal cargo vessels.

2.3.2 KUWAIT (population 1,36 million)

2.3.2.2 Coastal Traffic Flows

Due to a lack of detailed information on cargo composition and trade flows carried by the Kuwait coastal fleet, some assumptions were made to evaluate the traffic between Kuwait and Bahrain, Oman and Qatar. Assuming that all the traffic has been carried by sea, the following calculation of the traffic in tons and ton-miles could be made (see table 22).

Table 22. Short-sea Traffic between Kuwait and three Gulf States (1978) (excluding oil and oil products)

	Imports		Exports/re-exports		T o t a l	
Country	(000) tons	(000) ton-miles	(000) tons	(000) ton-miles	(000) tons	(000) ton-miles
Bahrain	2,1	512,4	6,8	1659,2	8,9	2171,6
Oman	3,1	2108,0	1,6	1086,0	4,7	3194,0
Qatar	7,8	2511,6	15,1	4862,2	22,9	7373,6
Total	13,0	5132,0	23,5	7607,4	36,5	12739,2

Source: Calculated on the basis of national sources.

Exports and re-exports in tons from Kuwait to the three countries exceeded imports from them by 80 per cent in terms of tons and by 33 per cent in terms of ton-miles performed. The average length of haul in miles for imported goods was 395 miles and for exports and re-exports was 323 miles. Approximate calculations of the carrying capacity of the Kuwaiti coastal fleet showed that the fleet could transport around 45 per cent of cargo and the rest might be carried by ocean going vessels or non-Kuwaiti fleet. In fact, this proportion is increasing in favour of foreign fleets due to the fact that on the most coastal routes the traffic is not balanced. The development of Kuwaiti coastal trade is given in table 23.

Table 23. Kuwaiti Coastal and Short-sea Trade

Year	Imports (000) tons	Exports/Re-exports (000) tons	Total (000) tons
1972	127.1	137.4	264.5
1973	126.7	74.3	201.0
1974	132.2	65.2	197.5
1975	109.0	55.6	164.6
1976	105.9	43.4	149.3
1977	138.6	49.7	188.3
1978	381.3	48.6	429.3

Source: Compiled on the basis of national sources.

Kuwait is one of the transhipment centres in the Gulf. Cargo destined to some countries in the region is brought to Kuwait by ocean going vessels from Europe, Japan, South-East Asia and American to be unloaded at kuwait and further transported by roads or coastal craft around the region.

Table 23 shows that exports and re-exports has been declining during the first half of the seventies and settled at around fifty thousand tons per year while short sea imports show a level at 130,000 tons per year with a sudden increase to 381,3 thousand tons in 1978. This increase coincided with the growth of the total imports to Kuwait which had also increased by three times in the same period.

2.3.2.2 Coastal Fleet

Table 24 shows the ownership and inventory of the Kuwaiti coastal fleet.

Table 24. Composition of Kuwaiti Coastal Fleet (1980)

Owner	No. of vessel	Type of vessel	Date of Buildg.	DWT (tons)
1. Haji Chuloom	1	General cargo	1950	600
2. Shaik-han Ahmad Alfarsi Co.	1	"	1948	574
3. Al-Nisr Trading Co. WLL	2	"	1951/62	827/589
4. Abdulla Hamad Al-Sager	1	"	1949	569
5. Ahmad Al Sayed Abdul Al Samad	1	"	1957	701
6. Hussain A. Al Sarraf & Bros.	2	"	1945/61	300/320
7. Faisel Hammoud Ali Hussein Bash	2	"	1937/57	404/437
8. Abdul Basset & Co.	1	"	1950	591
9. Nasseb & Co.	4	"	2-1977 2-1978	3000
10. Sagar Shipping Co.	1	"	1959	500
11. Salem & Ghanem Co.	1	"	1930	500
Total	17			9912

Source: Compiled by ECWA/TCTD on the basis of national and international sources.

The eleven companies mentioned in the table own 17 vessels, with a total tonnage of 9,912 dwt, on average of 550 ton per vessel. With exception of the four ships of Nasseb & Co. which are recently built, the vessels are old second-hand ships in age ranging from 20 to 52 years bought from Europe or Japan.

The table below shows a composition of the fleet by age.

Table 25. Age Distribution of the Kuwaiti coastal fleet

Age of vessel	no. of ships	dwt	
		(000) tons	%
30 years and over	5	2,4	23.7
25 - 29	3	2,0	20.3
20 - 24	3	1,6	16.5
15 - 19	2	0,9	9.2
10 - 14	-	-	-
5 - 9	-	-	-
0 - 4	4	3,0	30.3
Total	17	9,9	100

Source: Compiled by ECWA/TCTD on the basis of national and international sources.

The majority of the general cargo vessels, is more than 20 years old; and more than one third exceeds 30 years of age. Therefore, most of the Kuwaiti coastal fleet already exceeds or is about to reach its economic life time.

Four vessels of the Kuwaiti coastal fleet, with 30,3 per cent of the total tonnage, belonging to Naseeb Shipping Company have the age of around 5 years. These four general cargo vessels were bought from Japan in the late seventies. The fleet of the company is renewed every five or six years to sustain efficient and provide a profitable service. These vessels, fitted with two engines, carry general cargo between Kuwait and Bahrain, Iraq, Oman, Qatar and UAE. In 1980 this fleet has transported about 40,000 ton of general cargo. In addition to these vessels the Company owns 12 barges and several tugs.

Before hostilities started in the Gulf, the Company's fleet called at various Iranian ports. At present the vessels call only at port Busher. On their way back from Iraq, in most cases, the vessels sail empty. Such an unbalanced load factor has a negative effect on the productivity and the efficiency of the fleet, and this does effect the profitability and the freight rates as well.

2.3.3 Lebanon (population 3.16 million)

2.3.3.1 Coastal fleet

Lebanon owns the largest coastal fleet in the region. The 95 general cargo ships are participating in short-sea and coastal trade along the East-Mediterranean. The total tonnage of the Lebanese coastal fleet reached more than 70,000 ton in 1978. The 95 vessels have an average dwt of 740 ton and they are owned by 57 local companies. Most of these companies own one or two general cargo vessels.

Table 26: Composition of the Lebanese Coastal and Short-sea Fleet (1979)

Company	no. of vessels	type of vessels	date of bldg.	dwt (tons)
1. Kamal Mohamed Add and Ahmad Haj Omar	1	General cargo	1956	783
2. Mourjeily Shipping Co.	2	"	1938-1	500
3. Agence General Maritime (AGEMAR)	3	"	1956-1 1957-1 1961-1	837 975 900
4. Ali Karim Ahmed & Shafshaen Mohamed Bassam	1	"	1924	218
5. Mohamed Afif Ahmed	1	"	1940	400
6. Ahmed Abdul-Al	1	"	1953	798
7. Ally & Nasr Navigation Co.	1	"	1956	674
8. Mohamed Khalid Al-Masri	1	"	1966	700
9. Osman Mustafa Arabi	1	"	1957	700
10. Moustapha Baghdadi	1	General cargo	1956	783
11. Anis Begdache & Mohamed Henco	1	"	1947	500
12. Chukri Bayzid; Osman Ismail & Co.	1	"	1950	681
13. Berytus Navigation Co. (LLC)	1	"	1952	500
14. Madih A. Chami	1	"	1952	750
15. Metri Michel Cocony	1	"	1947	750
16. Hussein Mohamed El Fakih	1	"	1948	559
17. A. Adel El Laouin Marine	1	"	1957	895
18. A. Elias (Overseas) Co. Ltd.	2	"	1959-1 1955-1	660 475
19. Zeineb Fakhoury & Anis Begdache	1	"	1964	487
20. Saleh Youssef Fatha & Co.	1	"	1955	874
21. Y.A.A. Fattai	1	"	1954	549
22. Nizar Ghandour	1	"	1938	437
23. Choumrawi Shipping Co.	1	"	1955	701
24. Osman H. Habbal	2	"	1955-2	1659
25. Ahmed Sadallah Haddad	1	"	1956	1080
26. Ahmed Sayed Issa Martime Agency	3	"	1956-1	2079
27. Haikaram Kalindjian	1	"	1955	659
28. Mohammed Khatib	1	"	1956	700
29. N. Khoury & Suleiman Abou-Korch	1	"	1939	330
30. Phoebus D. Kyprianou	2	"	1949-1 1950-1	600 650
31. Lebanese Maritime Associat. S.A.L.	1	"	1963	1275
32. Lebanese Shipping Union	3	"	1964-3	2796
33. Masri & Co. Ltd.	1	"	1961	1050

Table 26 (Cont'd)

34. Ghassan Nasser Masri	2	"	1958-1	780
			1960-1	700
35. Mohamed Ahmad-nagi Masri	1	"	1954	600
36. Medawar Shipping & Clearing Co.	1	"	1953	533
37. Mekani Co.	1	"	1956	711
38. Mograbi King	1	"	1958	630
39. Mohamed Taher Rachad Moubayed & Co.	2	"	1953-1	718
			1958-1	910
40. Pan Arabian Trading S.A.R.L.	3	General cargo	1936-1	561
			1941-1	655
			1942-1	750
41. Romed Chafic Rahme	1	"	1963	990
42. L. Raissis Shipping Agency	1	"	1955	787
43. Kaddoura Abdel Raouf	1	"	1958	943
44. Nasser Rifaat & Co.	1	"	1954	850
45. Fahed S. Roumith	1	"	1950	743
46. Henry Sabbagh	1	"	1950	793
47. Ets. Jean Sabbagh S.A.L.	1	"	1938	600
48. Mohamed Ali Mohamed Dib Al-Sawalini	2	"	1957-1	620
			1961-1	970
49. The Shipping & Trading Co.	1	"	1956	828
50. Makie Sikias & Sons	2	"	1923	250
			1947	300
51. Bachir Ahmed Sinno & Raymond Bechara Chahla	1	"	1954	701
52. Bachir Sinno & Ali Badra	2	"	1959	786
53. Fouad A. Sinno & Co.	6	"	1940	660
			1954	533
			1956-2	920
			1957	752
			1958	800
54. Sinno trading & Navigation Agency	7	"	1951	600
			1952	950
			1956	750
			1959	996
			1965	617
			1966-2	1343
55. Societe Nationale de Navigation Maritime Tripoli S.A.R.L.	2	"	1957	559
			1960	1016
56. Union Commercial Co.	10	"	1950	910
			1959	920
			1960-2	1830
			1961-1	1044
			1964-5	4980
57. Zues Shipping Co. Ltd.	1	"	1948	701
Total	95			70328

Source: International publications and information supplied by the lebanese shipowners Association.

Table 27: Age Composition of the Lebanese Coastal and Short-sea Fleet

Age of Vessel	No. of Vessel	DWT	
		(000) tons	%
30 years and over	17	8,7	12.3
25 -29	17	11,7	16.7
20 - 24	37	20,3	41.7
15 - 19	20	17,9	25.5
10 - 14	4	2,7	3.8
Total	95	70,3	100

Source : Compiled by ECWA/TCTD on the basic of national and international sources.

Table 27 shows that the age composition of the Lebanese short-sea and coastal fleet is similar to that of other countries of the Region. The fleet consists mostly of relatively old second-hand vessels. A large group of 71 vessles, representing more than 70 per cent of the dwt, is over 20 years old, and one quarter of them even exeed 30 years of age. Only 4 vessels, 3.8 per cent of the tonnage, are relatively new. To keep such a fleet in operational conditions requires expensive maintenance and repairing. Data on the financial performance of the Lebanese fleet are not available.

2.3.4. Oman (population : 0.89 million)

2.3.4.1. Coastal Traffic Flows

Occupying the North East corner of the Arabian peninsula, the Sultanate of Oman is traditionally holding a strategic trading position in the region. Ancient Oman used to be the market place for merchants from India, the Far East, Africa and the Arab World. And Muscat is said to have been the home town of the legandary Sinbad the Sailor.

At present Oman preserves its position as an important sea cross-road. Omani coastal and short-sea trade is carried out with other Gulf States as well as with India, Pakistan and in a lesser proportion with the Red Sea States. Oman's modern major port, Mina Qaboos also serves transhipment cargo for southern Oman and the

Gulf States. During the monsoon, an average of 20 dhows per month call at Mina Qabous, mostly engaged on trade with India. The absence of statistical data on the cargo carried by road and sea transport makes it difficult to give accurate conclusions concerning the development of coastal and short-sea trade of Oman. Some estimates could be made based on the foreign trade statistics and on the assumption that 100% of trade between Oman and countries outside the region and up to 50% within the region is carried by sea. In the following table 28 the estimates of Omani coastal and short-sea imports are given:

Table 28: The Omani Coastal and Short-sea Imports by Countries and Commodities (1979)

Country	Food Product (000) tons	%	Con-struction materials (000) tons	%	Manufactured goods, machinery & equipment (000) tons	%	Total (000) tons	%
Bahrain	-	-	0,5	0.8	-	-	0,5	0.2
Iran	1,2	2.6	25,3	24.8	0,1	0.1	16,6	7.9
India	8,0	17.5	29,3	45.2	93,9	90.5	129,7	61.6
Kuwait	-	-	-	-	0,1	0.1	0,1	-
Pakistan	13,2	28.9	13,6	22.0	0,3	0,3	27,1	12.8
Qatar	-	-	0,1	0,2	-	-	0,1	-
U.A.E	23,3	51.0	4,3	7.0	9,3	9.0	36,9	17.5
Total	45,7	100	61,6	100	103,7	100	211	100

Source: Compiled by ECWA/TCTD on the basic of national sources.

Among the cargo carried in short-sea trade, the manufactured goods are prevailing and constitute 49 per cent of the total coastal imports in 1977. This group is followed by construction material, at around 29 per cent, and food products at 22%. The next table 29 shows the coastal and short-sea traffic in tons and ton-miles with some countries.

Table 29: The Coastal and Short-sea Imports of Oman in tons and ton-miles (1979)

Country	Tons carried (000) tons	&	Ton-miles performed (000) ton-miles	%
Bahrain	0,5	0.2	225,5	0.2
Iran	16,6	7.9	4050,4	2.9
India	129,7	61,6	113487.5	80/0
Kuwait	0,1	-	66,6	-
Pakistan	27,1	12.8	13550,0	0.6
Qatar	0,1	-	46,6	-
U.A.E.	36,8	17.5	10332,0	7,3
Total	211	100	141788,6	100

Source : Compiled by ECWA/TCTD on the basic of national sources.

In terms of tons carried and ton-miles performed, India occupied the leading position with 61 per cent in terms of tons and 80 per cent in ton-miles in 1979. Among countries of the region, the share of UAE reached 18 per cent. Cargo coming from UAE is discharged at Mina Qabous, for distribution to Mina Raysut in the South and some small exports.

One of the newest industrial projects in the Sultanate of Oman is the construction of a cement plant with a yearly output of around one million ton. It is expected that about half of this output may be exported by sea to Kuwait.

2.3.4.2 Coastal Fleet

Omani coastal and short-sea fleet consists of several vessels and many dhows. At present the dhows are gradually losing their importance and are not taken into the statistics provided by the authorities concerned.

Table 30: Composition of the Omani coastal and Short-sea Fleet

Name of owner	no. of vessels	type of vessels	date of buildg.	dwt tons
1. Ambola Contracting and Trading Co.	1	general cargo	1964	760
2. Oman Forwarding and Maritime Agency	1	"	1965	822
3. Government of Oman	1	"	1958	833
4. Shamfari Shipping	1	"	1974	1136
5. Ministry of Communications	4	"	1977-78	600
Total	8	general cargo		4101

Source : Compiled by ECWA/TCTD on the basis of national and international sources.

The coastal fleet consists of 8 general cargo vessels; with a total tonnage of about 4,100 dwt. Each company owns one general cargo vessel, and the Ministry of Communications operators four small Ro-Ro ships built in 1977 and 1978, with a total of 600 dwt.

Table 31: Age Distribution of Omani General Cargo Vessels

Age of vessels	no. of vessels	dwt	
		(000) tons	%
30 years +	-	-	-
25 -29	-	-	-
20 -24	1	0,8	19.5
15 - 19 -	-	-	-
10 - 14	2	1,6	39.1
5 - 9	1	1,1	26.8
0 - 4	4	0,6	14.6

Source: Compiled by ECWA/TCTD on the basic of national and international sources.

There is only one vessel, with an age of more than 20 years, the remaining of relatively new and may continue in service for many years.

2.3.5. P.D.R.Y. (Population 2 million)

2.3.5.1. Coastal traffic flows

The sea-borne trade plays an important role in the economic development of the country. Because of its geographical location the sea has been a most natural means of communications throughout countries. More than 90 per cent of the volume of the international trade is carried by sea. But the participation in this trade by the national fleet is minor and amounts to only 5-6 per cent. The main area for the usage of the national fleet is the short-sea service.

The Government has consolidated all shipping services in the state owned National Shipping Company (NSC) which was established in 1970.

The NSC extends its service to India, Pakistan, the Gulf and the Red Sea. Distances of sailing vary from 130 to 1,600 miles. General cargo is the major type of commodity transported by the NSC.

The main figures concerning activities of the National Shipping Company are given in the following table.

Table 32. The Activities of the Yemen National Shipping Company (1974 - 1979)

Year	cargo carried (000) tons	ton-miles performed (min) t. mis	average length of haul (miles)	dwt (tons)
1974	35,0	41,0	1171	3920
1975	46,6	42,6	914	3920
1976	44,2	39,6	898	3920
1977	34,9	36,8	1054	3920
1978	28,3	27,5	971	3920
1979	34,2	25,9	757	3920

Source: Calculated on the basis of information collected during the field mission.

The traffic in tons and ton-miles showed some decrease. For the period under consideration traffic in tons dropped slightly by 2.2 per cent and ton-miles by 36 per cent, reflecting the decrease in distances sailed.

Decrease in traffic may be due to several reasons; among them is the low load factor, which ranges from 30 to 40 per cent, and the time vessels often spend in ports waiting for cargo. The vessels are often out of operation in particular when bad weather is prevailing. The long waiting time in port signals the need for timely cargo group age before ship arrival, which in turn requires timely information on the sailing schedule. The size of the ships may also be a point of consideration. More frequent sailings of smaller ships may be more economic, strengthen the demand and smooth the cargo delivery.

2.3.5.2 Costal fleet

The fleet of the NSC consists of three dry cargo vessels. The vessels, bought from various countries, are engaged in the short-sea trade.

Table 33. Description of the NSC Fleet

Name of Vessel	type of vessels	country and year of Bldg.	grt (tons)	dwt (tons)	sailing speed (knots)
Aden	Feneral Cargo	Hungary, 1974	1350	1500	12
Mukalla	"	West Germany 1965	008	1800	10
Perim	"	Denmark, 1966	290	620	10

Source: Government authorities.

The Aden, built in 1974, is a more advanced vessel. The two others were bought as second-hand vessels.

The next table give estimates of the national fleets productivity in terms of tons carried and ton-miles performed.

Table 34. Productivity of the NSC fleet

Year	national fleet (dwt)	total general cargo carried (000) tons	total ton-miles performed (min) t.mls million ton miles	cargo volume transported per dwt (tons)	ton-miles performed per dwt (000) t. mls
1974	3920	35,0	41,0	9,0	10,4
1975	3920	46,6	42,6	11,8	10,8
1976	3920	44,2	39,6	11,2	10,1
1977	3920	34,9	36,8	8,9	9,4
1978	3920	28,3	27,5	7,2	7,0
1979	3920	34,2	25,9	8,7	6,6

Source: Calculated on the basis of information collected during the field mission.

2.3.5.3. Role of dhows

Apart from the cargo carried by the fleet of the NSC, coastal trade is traditionally carried by dhows. These dhows are engaged mainly in local trade and to some extent in trade with some Arab and African countries and India.

For some coastal areas, dhows have long been the traditional means of transport and communications. Since the development of road networks and road transport, passenger and cargo traffic by dhow has been declining rather drastically. In 1978 its share in the passenger traffic was less than 1 per cent and that in cargo traffic 3 per cent only.

The following table is showing the movement of dhows in Aden port.

Table 35. Dhows Movement in Aden Port (1970-1979)

Year	No of dhows called	Total NRT (000) tons	Cargo unloaded (000) tons	Cargo loaded (000) tons	Total tonnage handled (000) tons
1970	1316	125	N.A.	N.A.	89
1971	938	88	N.A.	N.A.	73
1972	703	70	N.A.	N.A.	533
1973	625	62	15	39	54
1974	557	53	14	33	47
1975	396	44	10	25	35
1976	231	25	3	12	17
1977	196	20	1,0	12,3	13,3
1978	157	21	0,7	11,2	11,9
1979	139	18,2	1,9	6,3	8,2

Source: Annual bulleting of transport and communication statistics, Aden, 1980, Data dollected during the field mission.

For the period 1970-1979 the number of dhows calling at Aden dropped by almost 90 per cent, and so did the volume of cargo. If this tendency prevails in coming years, dhows traffic will cease eventually. Aden is serving as a transhipment centre, and cargo arriving in ocean-going vessels is distributed by coasters and by road throughout the country, as well as abroad.

Table 36. Number of dhows entering Aden port by nationality (1975-1977)

Country	1975			1976			1977		
	No. of dhows	%	NRT (000) tons	No. of dhows	%	NRT (000) tons	No. of dhows	%	NRT (000) tons
PDRY	226	57	25,0	155	66,22	11,5	102	52	11,8
North Yemen	38	9,6	3,4	23	9,8	2,0	28	14,3	1,9
UAE	7	1,8	1,5	3	1.3	0,6	8	4,1	1,7
Ethipoia	-	-	-	1	0.4	-	-	-	-
Somalia	115	29	12,4	46	19,7	4,7	57	29,1	4,8
India	9	2,3	1,7	5	2,2	0,8	-	-	-
Djibouti		-	-	-	-	-	1	0,5	0,1
Other African States	1	0,3	0,1	1	0,4	0,1	-	-	-
Total	396	100	44,22	234	100	24,8	196	100	20,3

Source: Same as for table 35.

During three years, the number of national dhows calling at Aden dropped from 226 in 1975 to 102 in 1977 (55 per cent). The number of African dhows, mainly from Somalia, was the second in number; and the share of dhows from Arab States (YAR and UAE) was approximately 11 per cent in 1975 and 18 per cent in 1977.

The share of the coastal traffic in the country transport passengers and goods is very low. Out of the total number of passengers carried in 1977, only around 1 per cent was transported by coastal vessels transportation of goods is somewhat in 1976, the coastal reached 9 per cent of the inter-country trade.

The total number of passengers transported by dhows dropped by 49 per cent and that of cargo by 22 per cent during the period 1976-1977. For the same period the number of passenger and cargo in the inter-country movement increased by 14.5 per cent and 125 per cent respectively reflecting clearly a tendency of redistribution of cargo haulage in favour of the road transport.

Table 37. Country dhows' traffic between Aden and coastal settlements for the years (1976-1977)

Origin/ destination points	1976								1977							
	Passenger carried		Passenger/ miles		Tons carried (tons)		Ton/ miles		Passenger carried		Passenger/ miles		Ton Carried (tons)		Ton/ miles	
		%	000	%	000	%	000	%		%	000	%	000	%	000	%
Shihr	22	5.2	6,4	4.5	0,8	6,7	6.7	0.2	3	1.4	0.9	1.3	0.2	2.1	3.5	0.5
Mukalla	343	81,0	94,3	66.0	8,2	68.9	2260,1	60.8	165	76.7	45.3	64.0	7.1	76.3	1965.4	65.4
Qashan	3	0.7	1.4	1.0	0.7	5.9	321,3	8.6	1	0.6	0.5	0.9	0.3	3.2	121.8	4.0
Al-Ghaids	1	0.3	0.5	0.5	0.3	2.5	166,0	4.5	8	3.7	4.0	5.6	0.7	7.5	347.5	11.3
Socotra	36	6.5	21.6	15.0	1.6	13.4	237.8	25.2	16	7.4	9.6	13.5	0.8	8.6	454.3	15.1
Mayeon	18	4.3	18.5	13.0	0.05	0.9	20,9	0.6	22	10.2	10.4	14.7	0.03	0.1	12.3	0.4
Syhoot	-	-	-	-	-	-	-	-	-	-	-	-	0.1	1.1	59.2	2.0
Qusaiaar	-	-	-	-	-	-	-	-	-	-	-	-	0.1	1.1	33.7	1.0
Djibouti	-	-	-	-	0.2	1.7	3.0	0.2	-	-	-	-	-	-	-	-
Total	423	100	142.7	100	11.9	100	3712.8	100	215	100	70.7	100	9.3	100	3001.2	100

Source: Annual bulletin of transport and communications. Statistics, Aden, 1980

As demonstrated in table 37, the traffic between Aden Kukalla has the major share in the coastal shipping within the country Mukalla, at 3000km north east of Aden is the second town and the second port in PDRY, serving the Eastern region and has a population of 50,000 inhabitants. Before 1960, the Eastern region formed the separate state. As its capital at the time port Mukalla received the bulk volume of ocean going shipping. After the Eastern region was incorporated in the PDRY, much of the over-seas traffic at Mukalla disappeared. Cargo distined for the Eastern region is now unloaded at Aden and shipped to Mukalla by coasters and dhows. With the improvement of the road network, a growing proportion of goods appears to be distributed from Aden by Trucks.

One of the present technical difficulties at the port of Mukalla is the lack of sufficient depth of water along side the wharves for both coasters and ocean going vessels. This causes that cargo has to be transferred from ships to quays by lighters. To overcome this problem, the Yemen Ports Authority is executing the construction of a new harbour including two general cargo berths, to accomodate ships till 10.000 dwt, fishery facilities and a power generation project.

Along with the development of the land transport network in the coastal areas, the shipping activities are declining, due to strong competition from trucks; although both transport modes perform far from efficiently. The road transport takes the main share of traffic within the country. Nevertheless due to the geographical situation of the country, the coastal shipping could well continue to play a significant role in the country's traffic.

In order to increase efficiency and to improve the quality of the services, the Government is considering the possibility of acquiring small vessels which can reach the shore and be handled without quays and equipment for loading and unloading. These vessels will be used only for coastal trade.

In June 1980, the Governments of both Yemens came to an agreement on setting up a joint shipping company. The main office of this company will be located in Hudaida with offices in Aden and other ports of the countries. This company will also deal with the sealtraffic between the two countries.

2.3.6 Qatar (Population 0.22 million)

2.3.6.1 Coastal Traffic Flows

Qatar coastal short sea trade is concentrated in the Gulf; and as for countries outside the Gulf area, India and Pakistan are the major partners in the short-sea trade.

Estimates of the short-sea and coastal exports are given in the following table:

Table 38. The Qatari short-sea and coastal exports (1978-1979)
(Excluding crude oil and oil products)

	1978		1979	
	(000) tons	%	(000) tons	%
Bahrain	1,9	8.8	2,9	13.3
Iraq	2,6	11.4	1,9	8.7
Kuwait	7,8	34.2	4,4	20.1
Oman	1,1	4.8	0,1	0.4
U.A.E.	3,0	13.2	2,9	13.2
Iran	6,3	27.6	9,7	44.3
	22,7	100	21,9	100

Source: Compiled by ECWA/TCTD on the basis of national and international sources.

At present there is no information for comparing sea and road traffic between Qatar and neighbouring states. It may be assumed that all trade between Qatar and Saudi Arabia is moved by road transport. In its relation to other countries, the short-sea and coastal trade estimates are based on the assumption that between 50 to 100 per cent of the trade volume is transported by sea. More detailed informatin is required to get a clear picture of the factual cargo flows transported in short-sea trade.

The main volume of the Qatar short-sea export traffic is carried to Kuwait, representing around 34 per cent of the total volume in 1978, and 20,4 per cent in 1979. As for other countries of the region, their share in terms of tons are not significant. Traffic with Iran and Kuwait constituted together more than 60 per cent of the Qatar export trade flows.

2.3.6.2 Coastal Fleet

The Qatari coastal fleet provides short-sea and feeder services between most of the Gulf ports. Distances vary from 400 to 1,000 mile.

The coastal and short-sea fleet consists of 15 vessels, most of which are tugs and barges. Dead weight of these vessels vary from 500 to 3,000 tons. Two multipurpose cargo vessels, the Aljabor, built in 1955, and the Umm Al-Sahif, built in 1978, have a total deadweight of 883 tons. Landing crafts and small container feeder vessels are also in service.

2.3.7 Saudi Arabia (Population 8.37 million)

2.3.7.1 Coastal traffic flows

Saudi Arabia has the largest territory in the region, and the longest sea-coast line. The coastal shipping, because of the geographical situation of the country, is carried out between the national coastal ports of the country and the Gulf States and the Red Sea States. There are also feeder services from major transhipment centers to coastal settlements. In earlier time, goods were brought to Saudi Arabia over land by camel caravans and over sea by wooden sailing vessels which did not require complicated port facilities. The development of the country, especially following the discovery of oil in the 1930's created increasing demand for port facilities. The discovery of oil brought about a variety of significant economic activities which resulted in a rapid growth of imports. The existing pattern of coastal shipping and short-sea services at that time could not meet the new requirements and the country became prone to serious port congestions. Saudi Arabia has since embarked on a scheme of large sea port development, providing the country with the facilities required by modern international maritime shipping.

The completion of a scheme for a modern road infrastructure in the country together with a net work of national air fields has entirely changed the transport pattern of a recent past. In the course of the fast road transport development, the significance of the traditional coastal trade has declined. Nowadays the short-sea and coastal shipping have taken a new shape. Along the Red Sea coast short-sea vessels upto 6,000 dwt are employed to carry livestock from East African countries mainly Somalia and Sudan to Jeddah. Some sugar and general cargo from Egypt and some African countries are also landed at Jeddah. Coastal and short-sea vessels carry a large import of construction materials, such as cement, steel, timber and general cargo as well as livestock from some African and other Red-Sea countries to Yanbu and Jizan. Limited quantities are also brought by dhows. There are regular passenger/Ro-Ro vessels transporting great numbers of pilgrims which visit the country each year.

In the Gulf, there is a short-sea freight trade between the small port of Al-Khobar and Iraq from where it is importing cement and rice. Part of the general cargo arrived in Al-Khobar from Bahrain where it is transhiped from ocean going vessels to coastal crafts and dhows. The distance between Bahrain and Al-Khobar is only a few kms and the vessels used in this trade are small coasters and dhows carrying an average cargo volume of about 50 tons. Following the completion of the causeway between Bahrain and Saudi Arabia, this particular water transport is expected to cease.

The crude oil and petroleum products shipped from Ras Tanura to the Jeddah refinery dominated the pattern of the coastal cargo movements. The total of petroleum shippments (crude and products) from Ras Tanurs on the Gulf coast to the Jeddah refinery reached a yearly volume of around one million metric tons. The future of the coastal shipping of crude oil and oil products much depends on the development of the pipeline networks, mostly the Trans-Arabian Pipeline between the eastern oil fields and the Red-Sea coast.

Coastal shippment of dry cargo has become almost negligible since the construction of the road infrastructure in the coastal areas. Only small volumes of food-stuffs are carried by dhows fitted with engines.

Absence of statistical data on the trade flows, carried by the various modes of transport, does not allow for any exact calculation of coastal and short-sea trade flows. Some estimates could be made, assuming that certain cargo flows might be considered as short-sea or coastal transportation and that trade with some countries might be carried out exclusively by sea over short distances.

In the next table estimates of the coastal traffic with some countries are given:

Table 39. The Saudi Arabian short-sea imports from some countries (1977-1978)
(excluding oil and products)

	1977		1978	
	Imports (000) tons	%	Imports (000) tons	%
The Gulf				
1. Bahrain	55,9	80.6	1,2	4.4
2. Iran	11,9	17.2	21,7	78.3
3. Oman	1,5	2.2	4,8	17.3
Sub-total	69,3	100	27,7	100
Red-Sea				
1. Ethiopa	18,0	28.1	10,5	7.4
2. Kenya	1,2	1.9	1,0	0.8
3. P.D.R.Y.	1,6	2.5	0,4	0.3
4. Somalia	18,8	29.3	30,0	21.1
5. Sudan	24,5	38.2	100,1	70.4
Sub-total	64,1	100	142,1	100
Total	133,4	100	169,8	100

Source: Compiled by ECWA/TCTD on the basis of national and international sources.

In the Red-Sea area, the main import flows come from Somalia and Sudan. Both countries exported 43.3 thousands tons representing 67.7 per cent of imports from the East African States and PDRY. In 1978, this trade showed a substantial increase over the previous year and reached 130 thousand tons representing 95.5 per cent of the total. The commodities are mainly food-staff and livestock.

In the Gulf area, it was only possible to select coastal trade flows from three countries, where goods are carried mainly by sea. Imports from these countries dropped substantially from 69,3 thousnad tons in 1977 to 27,7 thousand tons in 1978 mainly at the expense of cargo coming from Bahrain.

2.3.7.2 Coastal fleet

In 1974, the total Saudi Arabian fleet counted only 15 vessels. The total tonnage of which was 67,290 dwt. Since then the Saudi Arabian fleet has changed completely and reached 2,145,388 dwt in 1978. The estimates of the coastal and short-sea fleet, derived from the total fleet tonnage-wise is presented in the table 40.

Table 40. Estimated composition of the Saudi Arabian coastal and short-sea fleet

Owner	Number of vessels	Type of vessels	Year of bldgd.	dwt (tons)
1. Abdullah Abbar and Ahmed Zainy Cold Store	1	general cargo	1962	1641
2. Hussein Taher Abdullaziz	1	oil tanker	1958	400
3. Alhamra Trading and Transport Establishemnt	1	general cargo	1953	1312
4. The Arabian Navigation Co.	1	general cargo	1957	559
5. Arabian petroleum Supply Co. S.A.	1	oil tanker	1966	1528
6. Arabian Trading Co. for Cold storage	2	general cargo	1958	2626
7. Ahmed Mohamed Baaboud and Co.	5	3 general cargo 2 livestock carrier	1940 1951 1953 1961 1962	5631
8. Baghdadi Shipping and Trading Co.	1	general cargo	1957	689

Table 40 (Cont'd)

Owner	Number of vessels	Type of vessels	Year of bldg.	dwt (tons)
9. Bakri Navigation Co. Ltd.	1	oil tanker	1962	828
10. Deciduous Fruit Co. S.A.	1	general cargo	1952	866
11. Elhawi Shipping Co. Ltd.	2	2-oil tankers	1952 1955	1,396
12. Hussein Mohamed Fayez and Sons	2	1-passenger cargo	1957	
		1-passenger vehicle ferry	1962	3,472
13. Mazen R. Pharaon Group	3	oil tankers	1960 1961 1962	2,382
14. Sayed Mohamed Sadaka Hitta	1	general cargo	1953	2,125
15. Jemal Commercial Est.	2	general cargo	1969 1970	796
16. Nassar Saudi Lines	3	3-general cargo	1951 1956 1957	11,740
17. Oriental Commercial Est.	1	general cargo	1938	2,581
18. Ibrahim Bin Samza Serafi	1	general cargo	1945	300
19 Abdul Aziz Hussein Taher	1	oil tanker	1963	345
20. The Shipping Corportation of Saudi Arabia	4	general cargo	1961 1962 1963-2	6,014
21. Trimimar Shipping and Trading Ltd.	1	general cargo	1946	560
22. Gulf Ro-Ro services S.A.	4	Ro-Ro	1976	2,641
Total	40			50,432
23. Petromin Tanker and Mineral Shipping Co.	3	oil tanker	1958 1975-2	109,900

Source: Compiled by ECWA/TCTD on the basis of national and international sources.

* The three tankers mentioned under 23 are also involved in coastal trade, between the Gulf and the Red sea, but being involved in bulk oil trade they are separately mentioned.

Most of the companies engaged in the coastal shipping own one of two vessels. To a large extent the Saudi dry cargo vessels are employed in the livestock trade across the Red-Sea. For this purpose second-hand ships are usually used. During the rainy season in East Africa, the duration of which is 2-3 months, these vessels carry cement, sugar and grains from Egypt, Sudan and Ethiopia to Saudi ports.

The Petromin Tanker and Mineral Shipping Co., is carrying oil between Ras Tanura and Jeddah. The company owns three tankers, the total tonnage of which is 109,990 dwt. The tanker Taiba was built in 1958. The two others named: "Petroship A" and "Petroship B", where delivered in 1975. The future prospects for coastal shipping of oil depends on the functions of the new pipeline and the share of oil products is the total oil package.

There are also a number of wooden made crafts employed in the coastal trade with the Arabian Gulf and the Red-Sea. These vessels are usually fitted with engineers.

Table 41. Age distribution of the Saudi Arabian coastal and short-sea fleet

(1979)

age of vessels	TYPE OF VESSELS: general cargo			tankers			others			total		
	no.	dwt (000) tons	%	no.	dwt (000) tons	%	no.	dwt (000) tons	%	no.	dwt. (000) tons	%
30 years	4	4,4	12.1	-	-	-	-	-	-	4	4,4	2.7
25 - 29	5	11,1	30.6	1	0.7	0.6	-	-	-	6	11,8	7.4
29 - 24	6	11,2	30.7	3	28,9	24.7	1	1,0	14.1	10	41,1	25.7
15 - 19	5	7,6	20.8	4	3,2	2.7	3	3,5	49.3	12	14,2	8.9
10 - 14	2	1,7	4.7	1	1,6	1,5	-	-	-	3	3,3	2.0
5 - 9	1	0,4	1.1	1	0,3	0.2	-	-	-	2	0,7	0.4
0 - 4	-	-	-	2	82,1	70.3	2	2,6	36.6	4	84,7	52.9
Total	23	36,4	100	12	116,8	100	6	7,1	100	41	160,3	100

Source: Compiled by ECWA/TCTD on the basis of national and international sources.

Estimates of the Saudi Arabian coastal and short-sea fleet show that the multi-purpose general cargo fleet is the biggest in number with a total of 36,400 dwt. The tanker fleet is the second in number and the first in terms of dwt. The third group contains different types of vessels namely livestock carriers, Ro-Ro vessels and passenger-cargo vessels.

As far as the age of the vessels is concerned, more than 35 percent of the total fleet is more than 20 years old. Two vessels, less than ten years old, are of specialized ro-ro type. Most of the coastal fleet is located in the Red-Sea, and is serving the sea trade between some African countries and the Red-Sea ports of the country.

2.3.8 Syria (Population 8.98 million)

2.3.8.1 Coastal Fleet

Data on the coastal and short sea traffic are not available. In general,the sub regional Mediterranean trade is carried out between Lebanon, Cyprus, Greece and Yugoslavia. The 45 Syrian vessels owned by the private sector are employed in this cross trade, most of the vessels have a dwt tonnage between 350 and 450 ton. Most Syrian coastal vessels are old, no longer in good condition and in need for replacement.

Table 42: Loading capacity of the Syrian coastal fleet

Load capacity per ship (tons)	Number of ships	Total capacity(tons)
160	1	160
350	19	6,650
450	19	8,550
800	1	800
950	1	950
1150	2	2,300
1400	1	1,400
1650	1	1,650
Total	45	22,460

Source : Compiled by ECWA/TCTD on the basis of available data.

Table 43: Age distribution of the Syrian coastal fleet

Age of vessel	No. of vessels	(000)tons DWT	%
30 years	6	2,1	9.3
25 - 29	14	5,3	23.5
20 - 24	17	7,1	31.5
15 - 19	6	5,1	22.6
10 - 14	1	1,4	6.1
5 - 9	1	1,6	7.0
Total	45	22,5	100

Source: compiled by ECWA/TCTD on the basis of available data.

Many Syrian vessels either exceeds or is near the end of its economic life, and may be expected to gradually phase out. Ways and means were to be found to encourage the owners to invest in new and modern vessels.

At this place it has to be mentioned that the coastal fleet of Cyprus is participating in servicing the mediterranean coast of the ECWA region. This fleet,however, is not included in the report.

2.3.9 U.A.E. (Population 0,80 million)

2.3.9.1 Coastal traffic flows

Coastal shipping in the Emirates exists in two forms. Firstly, as a country wise coastal shipping and secondly as a short-sea trade and feeder service in the Gulf.

The U.A.E. has developed into one of the largest transhipment centres in the gulf area and extends its feeder services to all Gulf States. In turn cargo transhipped at the other Gulf ports arrives to U.A.E. by sea and by roads. Because of the lack of statistical data on coastal trade flows, calculations are based on assumptions.

Table 44: The estimated short-sea imports of non-oil cargo by commodity group. (1978-1979), U.A . E.

Commodity	1978		1979	
	tons carried (000) tons	%	tons carried (000) tons	%
1. foodstuffs	62,0	49.0	70,5	55.6
2. construction materials	9,3	7.3	13,3	10.6
3. manufactured goods	55,5	43.7	42,7	33.8

Source: Compiled by ECWA/TCTD on the basis of national sources.

Excluding oil, the main cargoes carried in coastal trade are foodstuffs and manufactured goods. In 1978 both groups formed more than 92 per cent of the imported commodities. In 1979 the volume of food stuffs carried, reached 70 thousand tons or 55.6 per cent of total short-sea imports and the manufactured goods amounted to 42.7 thousand tons or 33.8 per cent.

In the geographical distribution of the imported commodities in coastal and short-sea trade Iran, India and Pakistan occupy the leading position. Together in 1978 their trade made up 87.6 per cent of the total short-sea imports. In 1979 the share of India, Iran and Pakistan was 83.7 per cent.

Estimates of the short-sea and coastal imports in tons and ton-miles are presented in the following table:

Table 45: Estimates of the coastal and short-sea traffic for the years (1978-1979), UAE (Excluding oil and products)

Country	1978				1979			
	tons carried (000) tons	%	ton-miles performed (000) t.m.	%	ton carried (000) tons	%	ton-miles performed (000)t.m.	%
1. Bahrain	3,4	2.6	918	1.2	3,9	3.1	1,053	1.1
2. India	49,4	39.0	59,280	69.1	45.0	35.3	54,000	58.8
3. Iraq	2,5	2.0	1,200	1.4	0.9	0.7	432	0.5
4. Iran	46,2	36.1	5,082	5.9	22,9	18.0	2,519	2.7
5. Kuwait	1,0	0.8	460	0.5	0.7	0.5	322	0.3
6. Oman	0,1	0.1	28	-	0.7	0.1	28	-
7. Pakistan	15,8	12.5	13,114	15.2	38,6	30.4	32,038	34.4
8. Qatar	5,2	4.1	1,040	1.2	14,1	11.1	2,820	3.0
9. Saudi Arabia	0,6	0.5	46	0.1	0,2	0.1	15	-
10.Somalia	2,2	1.7	4,400	5.1	0,1	0.1	200	0.2
11.PDRY	0,4	0.3	152	0.3	-	-	-	-
Total	126,8	100	85,720	100	126,5	100	93,427	100

The total ton-miles performed increased by 9 percent mainly because of the increase of the imports from Pakistan, the share of this trade was raised from 15.2 percent to 34.4 percent. Similarly, the average distance of sailing showed an increase from 677 miles in 1978 to 740 miles in 1979.

2.3.9.2 Coastal fleet

The majority of the fleet engaged in coastal and short-sea trade consists of general cargo vessels as well as numerous tugs, service crafts and dhows. Along the coast at Dubai, the dhow remains widely used in maritime transport. Yet, information concerning dhows are not included in official sources. The Dubai dhows are mostly engaged in feeder service between the Emirates' ports and other Gulf States.

Table 46: Composition of the United Arab Emirates coastal and short-sea fleet (excluding oil tankers)

Name of company	number of vessels	type of vessels	year of building	dwt(tons)
1. Sultan Ali Abdulla and Ali Bin Salim Bin Jassim	4	General cargo	1977	1,860
2. Yousuf Abdulla A.Rahim Ali Mirza	1	"	1955	681
3. Al Shamzi Trading Co.	2	"	1957-1 1958-1	1,629
4. Mohamed Saeed Al Yarwan and Obaid Saeed Al Yarwan	1	"	1957	737
5. Gowan Al Mohammad Badie and Co.	1	"	1957	460
6. Muruddin I. Chopra	1	"	1957	590
7. Ensena Marina Cia Naviera S.A.	1	"	1958	905
8. Saleh Farid Enterprises	2	"	1976	1,132
9. Fernson Shipping and Trading Co.	1	"	1957	714
10.Abdul Razzak Fikhree	1	"	1976	400
11.Gulf Agency Co.(Dubai)Ltd	1	"	1956	681
12.Gulf Mills Co.	1	"	1965	624
13.Hamza Maritime	2	"	1951-1 1952-1	907
14.Inter Gulf Maritime Co.	2	"	1951-1 1957-1	939
15.Masoud Comintor Co.	1	"	1937	422
16.Mustafa and Najibi Trading Co.	1	"	1958	1,005
17.Obaid Mohamed	1	"	1956	457
18.Oman Transport Establishment	1	"	1958	711
19.Sharjah Shipping Co.Ltd.	2	"	1957-2	1,250
20.Abdul Razzak Mohamed Saleh Al Haddad	1	"	1945	419
21.Amin Rasheed Shipping Corporation	4	3-Ot	1945-2	1,930
			1959-1	839
		1-Ro-Ro	1977-1	493
22. Oasis Trading Establishement	1	Ro-Ro	1977	380
Total	33			21,517

Source: Compiled by ECWA/TCTD on basis of national and international sources

Table 47: Age distribution of the U.A.E. coastal fleet

Age of vessel	number of vessel	dwt		
		(000)tons	average ton	%
30 years +	5	4,2	840	20.0
25 - 29	3	1,4	467	6.7
20 - 24	16	11,1	693	53.2
15 - 19	-	-	-	-
10 - 14	1	0,6	600	2.9
5 - 9	2	0,9	450	4.3
0 - 4	6	2,7	567	12.9
Total	33	20,9		100

More than 75 percent of the fleet consists of vessels with an age exceeding 20 years. The ships with an age of 10 years and less represent only 22.8 percent of the total tonnage. A relatively fleet (0-4 years) is representing some 13%.

2.4. CONCLUSIONS

The conclusions of this report are general in nature. The available information on the present situation are limited and not always consistent. Therefore the value of this report may be found in the evaluation of the present situation in coastal shipping as it appears today, and in an appraisal of the future role, and the ways in which this could be achieved.

Coastal shipping and short-sea services providing low cost transport play an important role in the national transport system as well as in the overall economic development of the countries in the region. However, it has recently lost much of its position in areas where it did not keep up with the modern requirements of reliability, frequency and quality of the services. And as in the case has also been mentioned in relation to inland water transport, much of the advantages of the low cost of water transport gradually disappeared and consequently a large share of the transport has been switched to road transport.

Modern transport based on the concept of integrated transport in which chain the various modes of transport used and the terminals at which the cargoes are stored and the transport mode is changed, have to be tuned to each other. The development of coastal shipping in the region therefore has to be considered in the framework of an integrated transport network.

Presently, general cargo is the main type of cargo carried by coastal fleets and between most of the ports in the region. A thorough analysis of the main items in the trade flow, whether imported directly or transhipped and re-exported has to be undertaken to determine the most appropriate means and categories of goods for coastal shipping;

The technological development in shipping is reflected in the new ships being introduced in coastal shipping. Yet, together with the new vessels, various old types of vessels and wooden made crafts are still in use. Many privately owned companies own and operate coastal fleets which in most cases consist of almost obsolete general cargo vessels. Such types of fleets require expensive maintenance and repairing and are rarely reliable and economical inoperation. In this respect further introduction of new types of modern coastal vessels are expected. Each type of ship used has its own particular characteristics and is usually suitable to a specific task or to a special economic and physical environment. The decision on the choice of ships

that will suit the trading requirements of any country should be based on careful consideration of the overall constraints of infrastructure, as well as on the economic and social problems involved. In general, it is advisable to have ships in any fleet to be replaced or renovated every decade.

Organizational aspects of coastal shipping are far from being adequate to meet the needs of developing economies. The requirements of organizational structures and managerial skills for fleet operating do need to be worked out properly. Structural changes however cannot be achieved "over-night" and therefore a careful planning of the changes in appropriate steps has to be carried out. It doesn't seem that the capacity for such overall planning is available in most of the shipping companies or even in the totality of shipowners/operators in coastal shipping in the Region. It does therefore seem appropriate that an expert team be engaged to formulate the requirements for fleet development, fleet management and operation and to look into the matter of promotion of coastal shipping within the future integrated pattern of transportation to and from the Region as well as within the Region.

In order to achieve a positive response, it will be necessary that the shipowners and their agents organize themselves within an association which could act as a counterpart to the expert team, and among others could assist in collecting relevant information, formulating the needs for related facilities and back-up services in prorts, etc.

There is a wide scope for improvement through co-ordination in the regional and sub-regional levels of coastal shipping. Cooperation would decrease the present uneconomic use of many vessles. It is therefore recommended to establish, within available shipping institutions an association of coastal ship owners at the country level, to improve the operating environment and to protect the interest of coastal shipowners. These associations could deal with technical, economical, operational, commercial and legal aspects of the coastal shipping. Other aspects of common interests are tariff structures, joint ventures, unitization of cargo, storage facilities in ports, safety and security, promotion of multimodal transport, fleet renewal, liability for ship and cargo, marine insurance.

It is advisable to develop an effective co-operation and co-ordination among the various national fleets, particularly in fields of modernization, organization of traffic and training. This would secure the national as well as the regional interests in the development of shipping.

The shortage of statistical information and detailed data is detrimental for any development. For the development of an effective modern coastal shipping it is necessary to improve, expand and develop the statistical information on transport in general for the analysis and planning of coastal shipping operation and development. The introduction of a maritime information service in the region could provide an important contribution to this matter.

It is also advisable to develop the present coastal shipping in the region to fulfill an effective role in serving and promoting the trade between the countries of the region as well as between the region and countries around. Coastal shipping should not be confined to the distribution of imported goods from developed countries. It has to be an efficient tool in the exchange of goods between developing countries and in the planning of economic development throughout the region. It is therefore recommended that coastal shipping and coastal ports be given adequate attention within the national plans as part of the integrated transport network of the country.

2.5. The Future of the Dhow

When the question arises what will be the future of the dhow, attention will have to be given to a great number of aspects. Among these are: the small scale economic developments which the dhow can serve, the facilities which can be given to the dhow among the big size cargo ships in ports, the cargo units which could fit both the dhow and the cargo ships, the storage facilities to be provided for dhows in the outports and landing places, the frequency of sailings it could provide to smaller communities as an economic alternative to other means of transport, which tariff structure

could provide an attractive proposition to certain cargo commodities and at the same time provide a sufficient return for the dhow owner to enjoy a reasonable income, important is also and the questions of the number of jobs the dhow fleet can provide, and the question of the multiplying factor in economic and job creating sense for the community in case the dhow can be maintained, may be in an adjusted form, in terms of boat building, maintenance, etc. Finally, and equally important, will be the question of foreign currency earning as well as the reduction of foreign currency expenses by replacing foreign imported ships, trucks and spare parts, by local boatbuilding and maintenance, and the possibility utilizing more effectively the wind energy.

In this respect attention has to be given to and courage has to be taken from the recent experiment in England, it is worth mentioning the example of the recent British experiment to build a new sailing cargo vessels, with auxiliary motor, to cross the ocean and to serve directly the small Caribbean Islands which now depend on a costly transhipment of the cargo. The cargo capacity of this first experimented vessel is 500 tons. In this light there may be a future for the dhow. A special regional project to study the possible development of the dhow with a capacity of some 200-300 tons which could form a low cost and flexible addition to the total maritime transport network in the region is recommended.

2.6. PROJECT IDENTIFICATION

DEVELOPMENT OF COASTAL TRAFFIC

1. A Project for a long term Technical Assistance Programme for the Development of Coastal Traffic

In the previous chapters an indication has been given of the range of areas which are in need of improvement in order to establish an efficient coastal transport service in the region.

The areas cover technical, economical, operational, commercial and legislative aspects.

There is much room for improvements of the existing situation which are necessary to re-establish productivity and efficiency in coastal transport, to keep up with the needs and also to benefit to its optimum of its typical economic advantages which can be summed up as follows:

- great capacity per unit
- low costs per ton kilometer production
- low energy consumption per ton km
- relative low foreign currency component in both capital investments in the transport units and in their maintenance compared to land transport
- low cost for maintenance of infrastructure (these costs are generally limited to those for the ports, which in principal may be self sustaining).
- high capacity of the infrastructure.

Using coastal transport, means most times being involved in a multimodel transport chain. The flexibility, the quality and the total costs of the entire transport package has to be taken into account, when comparing with the more expensive land transport modes.

The advantages of coastal transport therefore do not stand on their own in the multimodal concept. There are the additional cost factors of extra handling in ports, but there are also the additional facilities to transport, in the form of storage capacity in the port, combined with distribution, groupage and administrative back-up services. There are furthermore the insurance and banking services in the ports available to the cargo transport. All these services do add value to the commodities traded through the ports.

This is directly leading to the conclusion that coastal transport has to be restructured from being traditionally a single individual activity - as appears still to be prevailing in the Region - into being part in an integrated pattern which can offer the shipper and or consignee a "transportation package" which meets the needs. Such a transformation into a modern structured coastal shipping may include the introduction of new ship types together with new cargo handling methods and result in provision of new port facilities and related hinterland infrastructures.

Such a longterm development needs a concerted action of the public sector, with responsibility for infrastructure, legislation and employment generation and the private sector with responsibility for fleet development equipment, and operations.

Investments in longterm developments are inter-related, and therefore need to be integrated into a Master Plan for Coastal Ports and Shipping Services.

The Master Plan to consist of:

- a plan for port facilities for coastal shipping,
- a plan for port hinterland infrastructures,
- a plan for storage facilities for various commodities,
- a plan for ship-routing serving existing demand and foreseable future demand following social and economic developments in accordance with the National Development Plans,

- an economic evaluation of shipping services including tariff structures for various intermodal transport-packages,
- a national cost/benefit comparison between coastal shipping and land transport,
- a plan for an adequate network of coastal shipping agencies in all economic centres,
- a plan for an adequate transport information system (statistics and other data)
- recommendations for a policy of incentives for initiating new coastal services.
- a plan for establishing of coastal ship maintenance and repair facilities at strategic points in the region,
- a plan for development of manpower for coastal shipping and related services,
- an investigation in possible functions for the dhow in modern coastal shipping,
- a plan for integration of ships of individual ship owners into cooperative management organizations in charge with managing the shipping services, allocating ships, coordinating shipping agencies, negociating tariffs, and other related matters,
- a frame work for maritime administration and national legislation to support coastal shipping development.

Proposals for Short-term Developments in Coastal Transport.

There is ample room for Short term improvement in the coastal shipping in the region. The following projects are suggested:

1. Technical assistance in introducing a consistent information system on transport
2. Technical assistance for improvement of port facilities and port operations
3. Technical assistance for improvement of the operational efficiency of the existing coastal fleet
4. A case study for an intermodal transport package for a specific commodity based on coastal shipping.